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AUTOMOTIVE INDUSTRIES

The AUTOMOBILE

VOL. L

NEW YORK—THURSDAY, MAY 22, 1924

No. 21

Industry Finds Growing Profits in Foreign Sales

Changing automotive trends make overseas markets attractive.
Exports in first quarter of 1924 exceed those of same
period in 1923 by nearly 30 per cent.

By Norman G. Shidle

THE automotive industry is turning its attention to foreign markets with more intensity than ever before. This week in Detroit it is acting as host to automobile men from all over the world. In a series of meetings covering every phase of the business, the gospel of automotive transportation is being preached and its benefits are being described. Men of many creeds and races are gathered together to talk over specific problems connected with the sale and use of the motor vehicle in every part of the world.

While entertaining these representatives from foreign lands and while trying to give them a clear picture of what the automobile has done for the United States, manufacturing executives are engaged in learning from them something of the conditions, merchandising methods and selling practices common to the countries from which they come. And while this World Motor Transport Congress is going on American representatives in various countries are studying foreign problems and are pushing overseas sales vigorously.

The transport Congress in Detroit this week is but one sign of the exceptional interest in foreign trade current throughout the industry. Only recently Alfred Reeves, general manager, N. A. C. C., stated publicly that the time should not be far distant when foreign markets will absorb 25 per cent of our total production of cars and trucks instead of 8 per cent, as sta-

tistics would indicate that they do at present. When foreign buyers took approximately one month's production of the American automobile factories last year, executives began to realize more fully the practical advantages to be derived from developing these areas extensively. For many years a large part of the industry had been in the habit of regarding foreign sales as something to be considered after domestic needs had been cared for. This attitude has changed radically in the last twenty-four months.

Leading executives who once scoffed at the possibility of selling a million cars a year abroad are taking an active part in trying to make 1924 exports hit the half-million mark and are expecting to reach the higher goal within five or six years.

Exports of passenger cars from the United States and Canada for the first quarter of 1924 exceeded those of last year by more than 10,000, while Ford foreign assemblies made material gains over the same period. Latest reports indicate that there has been no falling off in export shipments since the end of March. Total vehicle export for the first quarter of 1924 were 29.8 per cent ahead of 1923.

While domestic production in the first quarter of this year showed an increase of about 18 per cent over the similar period for 1923, foreign shipments went ahead about 29.8 per cent. Moreover, continued prosperity in the overseas market seems almost certain for some

THERE is nothing particularly mysterious involved in selling abroad. Knowledge of the territories and customs is necessary, just as in domestic merchandising, but basic principles are the aim. Making money out of foreign sales is not a game. It is just a straight business proposition.

43,476

1923

U.S. + Canadian Passenger Car Exports for First Quarter

53,775

1924

months, while lower production schedules already have gone into effect as a result of decline in domestic buying. This is a further reason for the increasing attention being given to foreign sales outlets.

It has become increasingly evident for some time that car manufacturers have staked too much on quantity output as a road to profits. Economic conditions have made it difficult for production to keep on going up at the same rate of acceleration. As supply grew, the cost of marketing and distributing went ahead as well until finally the increased economies gained from greater production have been offset by the sky-rocketing of merchandising costs. If new sales outlets could be found, this difficulty might be remedied to some extent.

This condition supplies another basic reason for the intensity with which American car builders are looking at foreign markets. And there is every reason to believe that those markets are open to them. Many thousands of dollars have already been brought into the treasuries of those producers who have studiously cultivated the foreign fields and who have consistently and conscientiously merchandized their product there. New markets are available. They do not lie open in every case, but they can be opened by intelligent and persistent merchandising effort.

Planning Foreign Sales

Foreign sales are being planned today as an integral part of factory merchandising programs in many companies. Those firms which pioneered the overseas markets discovered that the same sort of analysis and sane, consistent effort that makes for success in domestic distribution is needed abroad. They are going about their foreign selling on that basis.

Consequently there is no longer much chance in the foreign markets for the man who wants to "take it or leave it alone" as he prides himself on doing with his liquor. Making money out of foreign sales is not a game. It is just a straight business proposition. There is nothing particularly mysterious about the methods to be used, although a thorough knowledge of the territories and customs of the various countries is necessary to success. The same thing is true, however, whether the merchandising effort is being made in Maryland or South Africa. The only difference is that the American car builder knows a bit more about Maryland to begin with.

But there is no great difficulty in the way of finding out all he needs to know about South Africa. He can sell cars there or any place else without the aid of a magician if he is willing to go about it carefully and patiently.

The Pan-American Road Congress scheduled for the first part of June, is another indication of the increasing interest of manufacturers in motor transport development by other nations. More good roads inevitably mean more car and truck sales and every effort is being made to show the people of other lands how to bring to themselves through highways the benefits that our people have derived from a similar source.

That real progress is being made, but that many problems remain still to be solved, is borne out by the current trend in automotive exports.

Increasing Interest in Motor Transport

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Passenger car exports for the first quarter of this year as compared with those for a similar period in 1923 are shown clearly by the following tabulations:

	January	
American	1923	1924
6,044		12,614
Canadian	4,666	4,094
<hr/>		
Total	10,710	16,608
	February	
American	8,848	13,329
Canadian	5,668	3,229
<hr/>		
Total	14,408	16,588
	March	
American	11,824	14,035
Canadian	6,426	6,474
<hr/>		
Total	18,250	20,509
	April	
American	13,352	
Canadian	4,436	
<hr/>		
	17,788	
American	Total for 1st Quarter	39,978
26,716		
Canadian	16,760	13,797
<hr/>		
	43,476	53,775

Exports of passenger cars increased in February and in 1923, but only held even this year. The March increase in 1924, however, made up for the slight recession in February and set a new high mark for the year at

20,509. The March total was made possible by a good sized increase in shipments from Canada.

April figures for 1924 are not yet available but reports from important exporters indicate that their shipments were at a higher rate than during March. Should this be the case, a considerable gain over 1923 will have been recorded for the first third of the year, since April last year was less than March.

It is too early to do more than guess at May foreign sales, but it is possible that fewer cars will be shipped than in April. Sales were spotty according to some producers, in the early days, but increased somewhat toward the middle of the month.

The truck figures for a similar period show up as follows:

	January	
	1923	1924
American	1,352	2,845
Canadian	369	1,775
Total	1,721	4,620
	February	
American	1,698	1,704
Canadian	438	783
Total	2,136	2,487
	March	
American	1,564	1,654
Canadian	883	2,087
Total	2,447	3,741
	Total for 1st Quarter	
American	4,614	6,203
Canadian	1,690	4,645
Total	6,304	10,848

Truck shipments in the first quarter of 1924 beat those of last year by 4,544 or about 72 per cent. Big gains were made in Canadian truck exports in every month, the January and March increases having been particularly heavy. While about one-third of the trucks were shipped from Canada in the first three months of 1923, two-thirds originated there in 1924.

January was the biggest truck month in the first quarter this year, but March held the premier place among the first three months last year.

Effect of British Tariff Removal

Removal of British tariff on automobiles has caused considerable comment in the last few weeks. While this development affects materially one very good market for American cars and trucks, its importance should not be overestimated. England buys many thousands of dollars worth of our automotive products and probably will buy more under the new scheme. There is little reason to believe, however, that the Canadian plants of American manufacturers will be closed down as a result of the new rulings. These plants were built, not to supply England

but Canada, Australia, New Zealand and various other colonial markets. Out of 150,000 motor vehicles built in Canada last year only 11,000 or about 7 per cent were shipped to England. The rapid increase in automobile registrations in Canada itself during recent years indicates that the present capacity of the Canadian factories might be used in the near future to take care of the needs of the Dominion and other British colonies alone.

There is little danger that "dumping" will take place. Too many sad experiences resulting from that practice still are vivid in the minds of automotive executives to permit a rejuvenation of such attempts to dispose of car stocks. It is generally recognized moreover that new car sales usually decrease in Great Britain after July or August so that there will be relative little chance for new car sales this year. The necessity of providing special models for the British markets also will help to hinder any tendency toward "dumping." Right hand drive is required on vehicles sold in the British Isles.

American Manufacturers Cautious

Investigation of plans of American manufacturers as regards England indicate very clearly that no precipitate steps will be taken. Action will materialize only after careful and detailed study of the situation.

Probably in anticipation of this tariff move, American manufacturers shipped relatively few cars to England during the opening month of 1924. U. S. and Canadian exports to Great Britain in January, February, and March this year were less than half as great as in the same part of 1923.

While these rather striking changes have been taking place in England, other automotive markets quietly have been absorbing motor vehicles at a constantly increasing rate. In the first three months of 1924, U. S. and Canadian shipments to Australia totalled 16,103, which is more than one-third the entire number sent to this lucrative market in all of 1923. Last year's figures show that there was no marked falling off in Australian shipments in the last three-quarters. If the trend this year is similar, the total 1924 sales in this market seem likely to climb over the 60,000 mark. This will mean an export business of more than \$45,000,000 in this market alone.

Shipments to some of the leading automotive markets for the first three months of 1923 indicate the present trend of sales. Here are a few comparisons showing the number of passenger cars shipped from U. S. and Canada:

	1st Quarter, 1923	1st Quarter, 1924
Australia	10,396	16,103
England	7,507	3,043
Argentina	1,418	4,340
Sweden	1,283	942
Mexico	1,792	968
British South Africa..	1,988	2,877
Spain	1,107	1,243

U.S. + Canadian
Truck Exports
for
First Quarter

6,304
1923

10,848
1924

The prosperity of British South Africa is reflected in the excellent showing made during the first three months. This country has taken almost twice as many cars as it did in the first quarter last year. Business is good in South Africa but distributors are taking care not to overstock. They feel very strongly that there must be no "dumping" in that territory. A good feature of this year's business thus far has been the large proportion of cash sales. The opening of the Johannesburg show in the latter part of April can be expected to have created added interest in motor vehicles.

Argentina continues to be one of the brightest spots in the automotive world. With shipments of vehicles from the United States and Canada during the first-quarter of 1924 practically triple those of the same period of last year, reports from Buenos Aires state that the local Ford assembly plant also has generously increased its sales, and has set schedules of output in excess of 25,000 for this year. Argentina has been for some years one of the largest buyers of American made cars, the importations and assemblies last year having totalled more than 25,000, as compared to about 15,000 the previous year. Trade advices, coupled with statements made by the Argentine Delegates to the Detroit Congress, indicate that further and important progress is now being made, particularly in passenger car, accessory and equipment business.

Spanish Treaty Remains in Force

Uncertainty about the commercial treaty with Spain has been ended by the announcement that the present treaty will remain in force for another year. Decision on this question would help sales considerably during the next twelve months. Other factors are favorable to an increase in Spanish business. The Spanish peseta which improved from 12.13 cents on March 8 to 13.43 cents, on April 9 continued its improvement until April 23 when it reached 14.16 cents, receding later to about 13.8 cents, where it remained until May 10. The situation is favorable to the import of products from the United States, according to Assistant Trade Commissioner, J. G. Burke. Reports show that Spanish industries are moving ahead more rapidly than they have for some time and industrial conditions generally are firmer.

Possibilities in Germany

Possibilities in the German market will be materially affected, of course, by the success achieved in working out the Dawes plan and the time at which the embargo is lifted. The vital interest of German dealers in the sales of American automobiles, however, is indicated by the large and enthusiastic delegation which is attending the Detroit gathering this week. It seems certain that a good many motor vehicles can be sold in Germany when political and economic conditions improve. There are many indications that such a time is relatively near. The domestic boom which began in Germany with the introduction of a stable currency continued throughout April and most industries have maintained satisfactory activity.

The sales showing in Mexico has been very good considering the unsettled political conditions which have prevailed in the last few months. Uprisings such as have occurred there inevitably throw commerce into confusion but the passenger car shipments have held up very well under the circumstances. Better business is to be expected during the remainder of the year, particularly in view of the reported Mexican loan which, it is expected, should overcome to some extent the present credit and currency stringency.

A general picture of the course of automotive exports and their relation to domestic production over a period

of years is given in a table recently prepared by the automotive division of the Bureau of Foreign and Domestic Commerce.

Figures for U. S. and Canada

Production figures include production of all manufacturers in the United States and Canada, as reported by the National Automobile Chamber of Commerce. In the section of the table covering exports, it must be borne in mind that Ford foreign assemblies were not reported prior to 1912, and that they were not separated as to cars and trucks until 1922; furthermore, that Canadian exports were not reported by number prior to 1918, and that they were not reported separately as to cars and trucks until 1919. Consequently, prior to 1912 the sum of "passenger cars" and "motor trucks" given in the table is less than the figures in the "total" column.

AMERICAN AUTOMOTIVE PRODUCTION AND EXPORTS, 1910-1923

Year	Production			Exports		
	Pass. Cars	Motor Trucks	Total	Total Prod.	Per Cent of Pass. Cars	Motor Trucks
1910	181,000	6,000	187,000	8,443	4.5	(a)
1911	199,319	10,655	209,974	15,807	7.5	(a)
1912	356,000	22,000	378,000	23,863	6.3	(a)
1913	461,500	23,500	485,000	33,602	6.9	25,880 1,009
1914	543,679	25,375	569,054	34,130	6.0	22,335 3,430
1915	818,618	74,000	892,618	76,218	8.5	41,864 22,094
1916	1,193,617	90,000	1,583,617	96,858	6.1	61,922 18,921
1917	1,740,792	128,157	1,868,949	99,002	5.3	65,756 14,479
1918	926,388	227,250	1,153,638	76,781	6.7	36,936 10,308
1919	1,657,652	316,364	1,974,016	124,549	6.3	86,742 18,937
1920	1,883,158	322,039	2,205,197	267,872	12.1	160,578 34,078
1921	1,514,000	147,550	1,661,550	97,852	5.9	40,705 8,901
1922	2,406,954	252,668	2,659,622	188,810	7.1	153,383 35,427
1923	3,694,237	392,760	4,086,997	327,875	8.0	255,268 72,607

(a) Separate figures not available.

Aluminum Paint Will Keep Out Heat

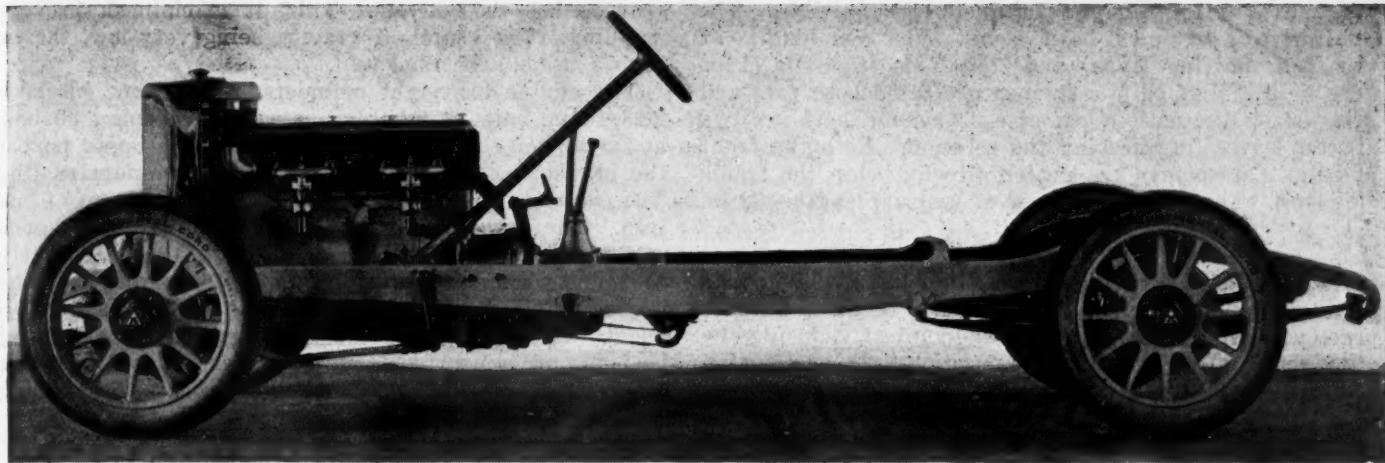
FIFTY per cent less heat from the sun will get through the top of an automobile if the top is painted with aluminum paint. The Bureau of Standards finds that the black materials generally used for the covers of automobiles and ice wagons absorb nearly 90 per cent of the sun's heat reaching them, and about half of this is re-radiated as heat on the under side. Applied on the under side of thin metal roofs, aluminum paint was found to cut in half the heat radiated underneath as compared with surfaces of corroded metal or ordinary paints.

In the case of tents the paint is most effective when applied to the under side, especially if a white reflecting paint is used on top. For automobiles and ice wagons the bureau recommends that the paint be applied to the top surface, especially where this is black.

Tests on house radiators, on the other hand, have shown that their effectiveness is reduced about 15 or 20 per cent by the use of aluminum paint.

Old paint need not be removed before applying aluminum paint, the bureau explains, nor is it necessary to remove the aluminum paint from radiators before applying another kind of paint to increase their effectiveness. In radiation it is the character of the surface that matters, and the effectiveness of aluminum paint in suppressing radiation or of non-metallic paints in promoting it are not affected by anything that they cover up.

These data are given in Technologic Paper No. 254 of the Bureau of Standards. Copies of this paper may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. The price is 5 cents.



Hansa-Lloyd eight-cylinder chassis, side view

The First German Straight Eight Has Aluminum Engine

New Hansa-Lloyd features include fan blades on the flywheel to discharge smoke and fumes from the engine underneath chassis, a novel method of venting the crankcase, and a dummy radiator built to give the effect of a V-type, but which has a flat core.

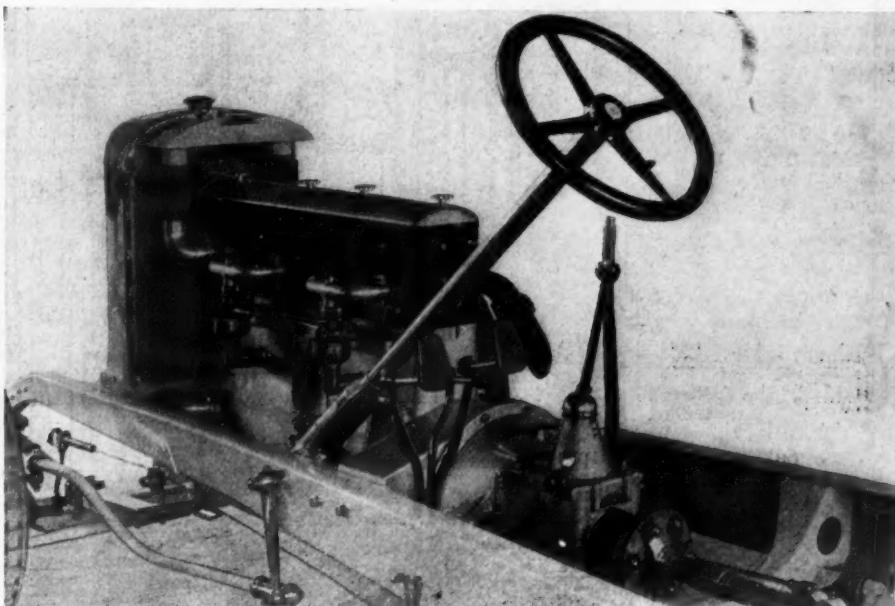
THE Hansa-Lloyd, the first eight-cylinder car to be built in Germany, is the product of a firm which has been turning out four-cylinder passenger cars as well as gasoline and electric trucks for about twenty years. Some years ago it was decided to bring out a high grade car with a multi-cylinder engine, and the concern experimented with different multi-cylinder designs before it adopted the present eight-in-line type. The eight-cylinder chassis replaces the four-cylinder one manufactured heretofore.

Although the chassis is designed to take a six-passenger body, which can be held comparatively narrow, the wheel track has been made slightly greater than standard, 5 $\frac{1}{8}$ in., the reason for this being that a short turning radius was desired. The type of engine used and the seating capacity necessitates a long wheelbase, 141 in.

The pressed steel frame is inswept at the front end and dropped at the rear, and the side channels have been given a very deep section at the middle to avoid sagging of the frame on bad roads and consequent squeaking of the body. Four cross members of channel section are provided. The forward one, of deep section, is arranged beneath the radiator and serves as front support for the unit-power plant, while the three others are located beneath

the front universal joint, midway between this joint and the rear axle and slightly behind the rear axle, respectively. The rearmost cross member serves as front support for the 22-gal. gasoline tank, the rear of which is supported by a cross rod connecting and stiffening the rear ends of the frame side bars. Fuel feed is by vacuum.

From the unit powerplant the rear axle is driven



Powerplant assembled on chassis

through a shaft with two fabric universal joints. The final drive is by spiral bevel gears. The rear axle is of the full floating type and the axle case is kept very light. Half elliptic springs are fitted both fore and aft. Above the master leaf of each spring there are two shorter leaves for checking the rebound. Both the front and the rear springs are located directly below the frame side bars. The rear springs are of unusual length—62 in.

Dummy V Radiator

Having regard for the predilection of German motorists for the V-type radiator (which has been found to have no practical advantages from the standpoint of reducing the air resistance) and for the increased cost of construction of a V-type core, the appearance of the V-type radiator has been combined with the simplicity and general practicability of the flat core. In front of the flat core there is a dummy which gives the appearance of a V-type radiator. A radiator shutter is mounted between the dummy and the core, and though it is invisible it is said to be quite effective.

Between the frame members in front of the radiator extends a splash plate which prevents splashing of mud onto the radiator and consequent clogging of its air passages. The steering post is located at the left and the gear shift lever in the middle of the chassis. It is of interest to record in this connection that the Hansa-Lloyd Works was the first firm in Germany to adopt center control, twelve years ago.

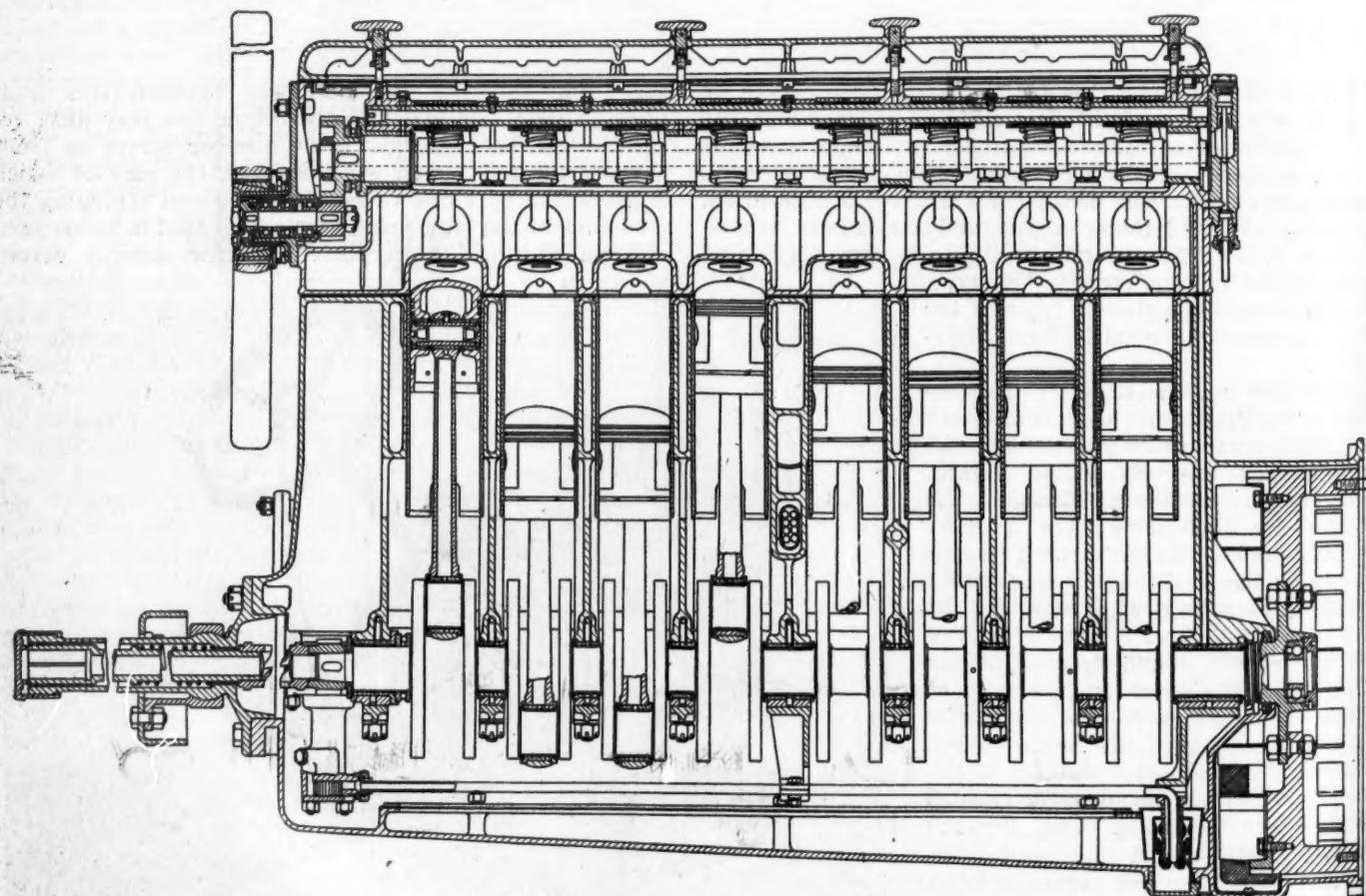
The car being a high powered, speedy type, it is natural that four-wheel brakes are fitted. There is an internal type of brake on each wheel. The brakes are actuated through cables and a special form of brake equalizer, which assures equalization of the force of application of the right front and left rear and of the left front and right

rear brakes respectively. This, it is claimed, prevents skidding. The center of gravity being very low, the car is said to hold the road well.

The engine has eight cylinders, cast in one block, of $2\frac{13}{16}$ in. bore by $5\frac{1}{16}$ in. stroke, developing 80 b.h.p. at 2200 r.p.m. All of the cylinders and the upper part of the crankcases are made in a single aluminum casting. The cylinders are provided with pressed-in liners of cast iron. The connecting rods are of hollow circular section and are completely machined, so that all weigh exactly the same. The crankshaft is supported in nine babbitted bronze bearings. The front, rear and center bearings are about twice as long as the six intermediate ones. All bearings are supported from the upper half of the crankcase. The big ends of the connecting rods also have babbitted bronze bearings.

Valve-Operating Mechanism

The cylinder head, of cast iron, is detachable and carries the valves, the overhead camshaft and its drives. The hollow camshaft is supported in four bronze bearings of larger diameter than the cams, so that the whole camshaft may be drawn out from the front end. It is driven through the same vertical shaft that drives the air pump. The valves are of nickel-steel and are inclined so as to insure easy flow of the gases; they are operated by rockers, arranged on a hollow shaft above the camshaft. The compression space is machined all over. The aluminum pistons have a domed head and carry three rings each. A considerable area of the piston surface over the ends of the piston pins is relieved, the idea being to reduce the frictional resistance due to shearing the oil film. All crankshaft and big end bearings as well as the bearings of the camshaft and valve rocker are lubricated by pressure. Oil is forced to these bearings by a gear pump located in



Longitudinal section of Hansa-Lloyd eight-cylinder vertical engine

the bottom of the crankcase and driven from the crank-shaft through a vertical shaft and helical gears. The small ends of the connecting rods rock on the piston pins, which latter are lubricated by pressure.

A vertical passage in the cylinder casting at the forward end, with an outlet at the top covered by a gauze strainer and an inlet on the outside extending in the direction of car travel, serves to maintain a circulation of cool air and to keep the supply of lubricating oil cool.

Splash lubrication is used for the pistons, and the relieve surfaces over the ends of the piston pins and the oil grooves at the lower end of the pistons are said to help in distributing the oil.

Engine Accessories

Two Pallas carburetors are fitted, each supplying four cylinders at one end of the block. The two throttles are positively connected. Air for the carburetors is drawn through a heating muff on the exhaust pipe and through a passage cored in the cylinder block. Cooling of the cylinders is effected by thermo-syphon circulation, there being two inlet and two outlet connections. It will be noticed from the cross-sectional view that the water jackets are of great depth, and the water completely surrounds each cylinder. It is a rather uncommon practice to use thermo-syphon cooling for such large cars as this, but the system has proven entirely practical on this car. The radiator fan is of cast aluminum, has four blades and is driven from the front end of the camshaft through a pair of spur gears, the safety clutch usual with positive drives being provided.

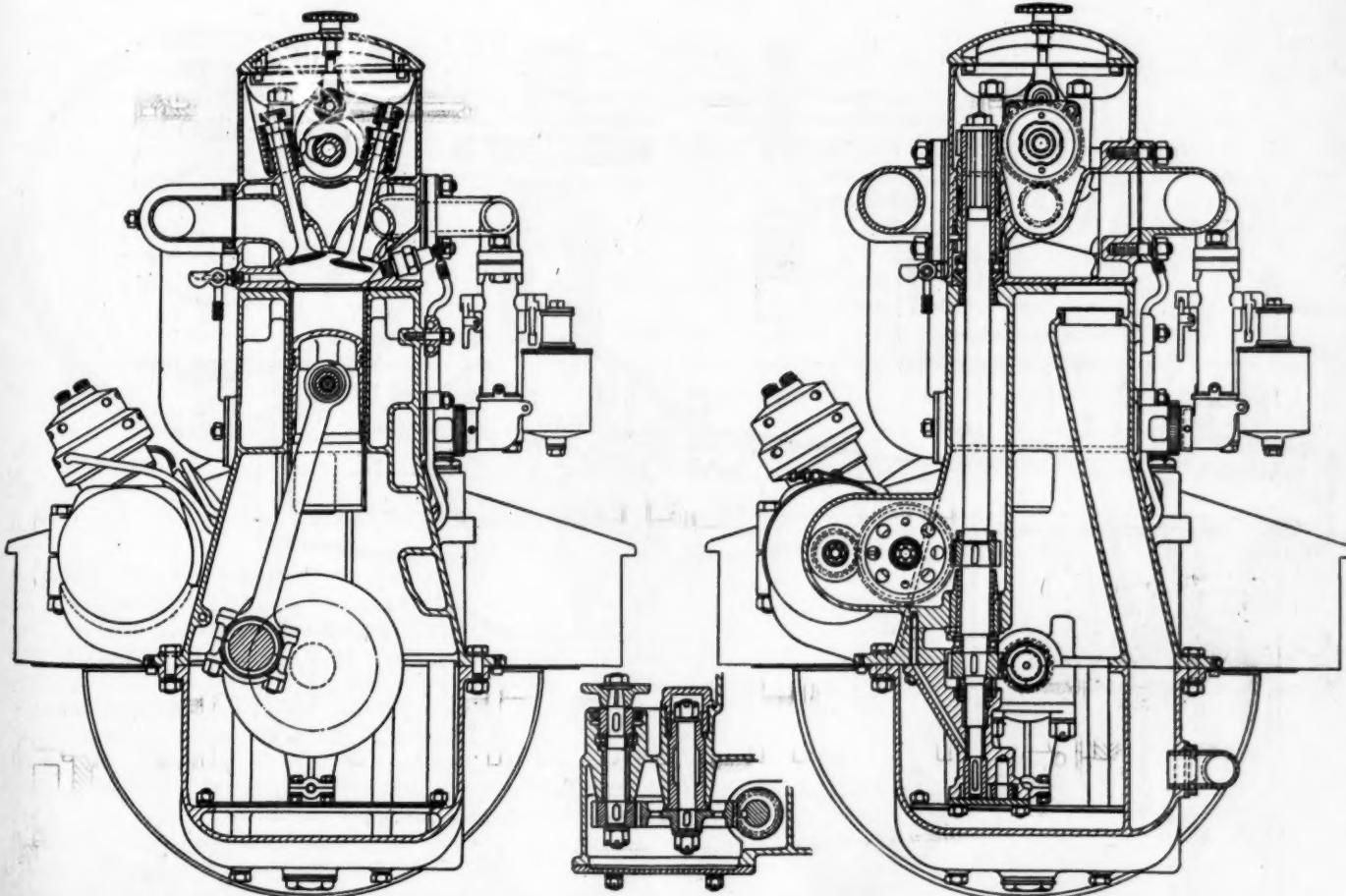
Battery ignition is employed, the ignition unit being combined with the Bosch generator, which is driven from the vertical camshaft-driving shaft through a set of helical

gears. The spark plug cables are carried from the generator to the spark plug side through a passage in the cylinder casting over the center bearing.

The starting motor drives to a toothed steel ring on the fly-wheel in the usual manner. To the forward side of the fly-wheel are secured sheet steel fan blades which serve to exhaust the foul air from under the engine hood, discharging it below the chassis and thus preventing it from getting into closed bodies, to the annoyance of the passengers. The inner side of the fly-wheel rim has rectangular recesses for driving the clutch disks. The clutch is of the single dry plate type with asbestos fabric lining and eight concentric springs. To facilitate gear shifting, a simple clutch brake is provided which can be easily adjusted from the outside. Between the disk secured to the fly-wheel rim and the transmission case there is a free space inside the powerplant case within which the clutch brake, the pedal shaft, etc., are located.

The gearset affords four forward speeds and reverse, and details of its design are shown by the drawings. It is very compact and has short, large diameter shafts running in double-row ball bearings. The gearshift lever is ball-mounted. An ivory plate fastened to the top of the gear lever carries a diagram indicating the gear positions. The peculiar manner of locking the gearshift lever in position is illustrated by the horizontal section through the gearshift case. The gear lever, when moved, carries along the locking pieces, which slide on two parallel rods. These locking pieces have rectangular pegs engaging into corresponding recesses in the shifting forks and preventing their longitudinal displacement.

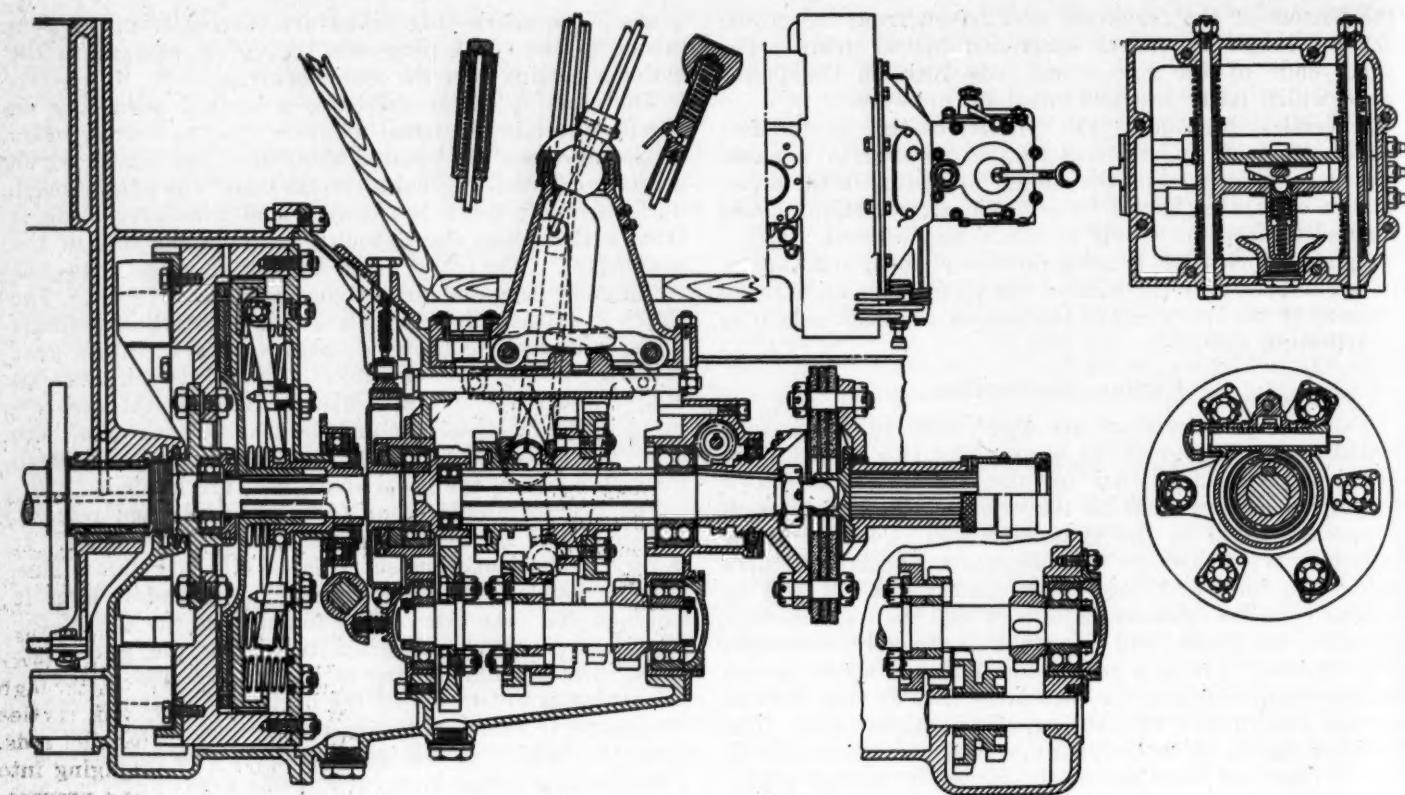
As mention previously, the propeller shaft has two fabric joints, and the torque and rear axle thrust are taken up by the rear springs. The double banjo type rear



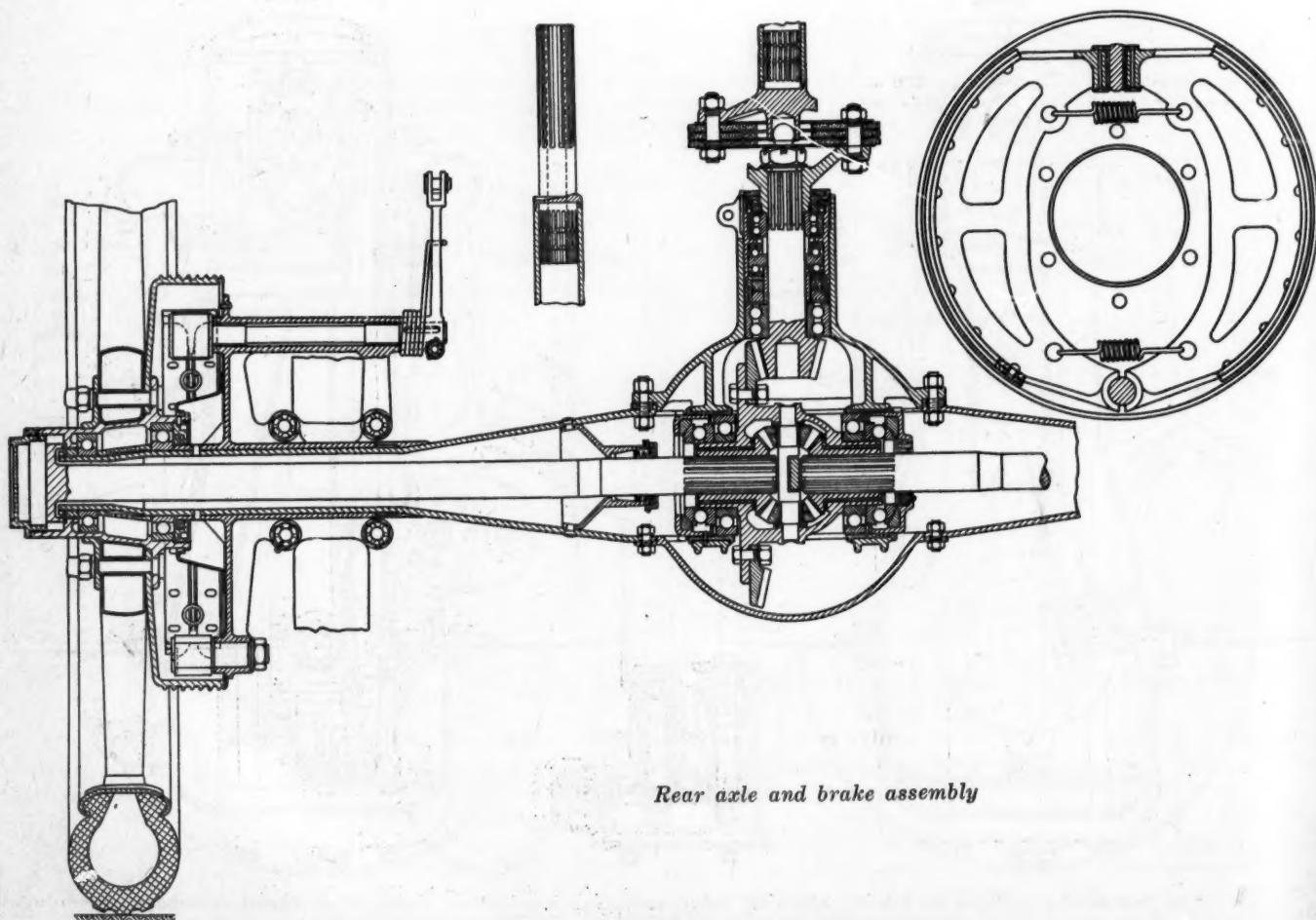
Two transverse sections of engine, showing valve actuating mechanism, drive of overhead camshaft, crankcase breather, etc.

FIRST GERMAN STRAIGHT EIGHT

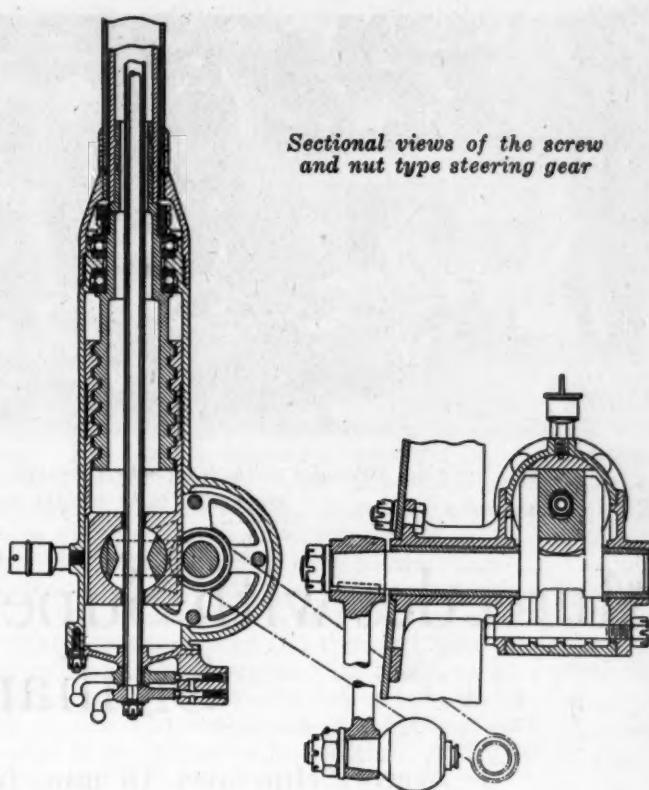
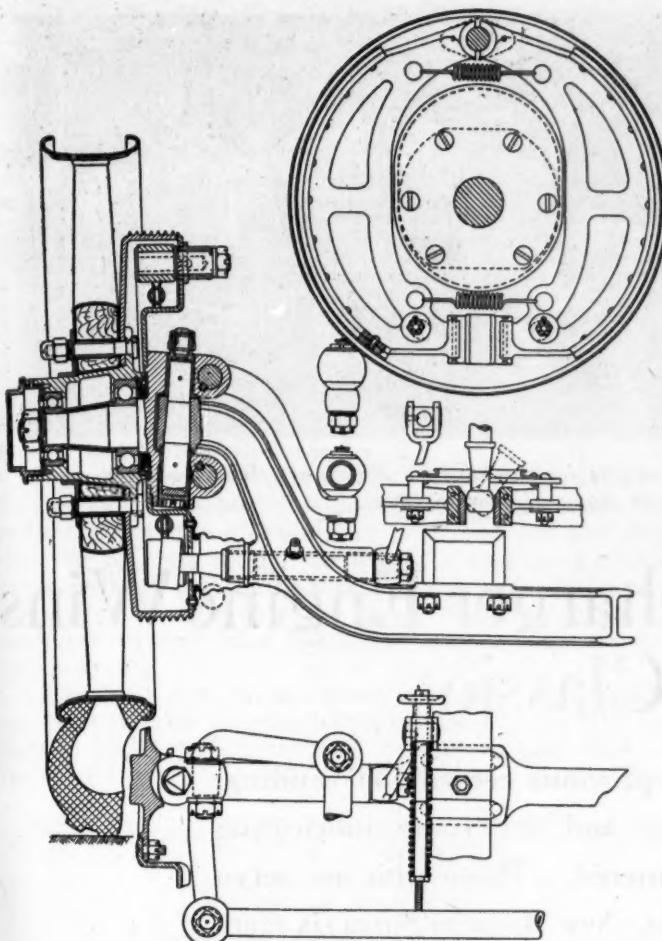
Automotive Industries
May 22, 1924



Hansa-Lloyd clutch and transmission with details of shift lever, reversing idler and disk type universal joint



Rear axle and brake assembly



(On left) Front axle end and front-wheel brake

axle case is pressed of very light nickel steel sheet. The axle is of the full floating type, so that its shafts are only stressed by torsion. Ball bearings are fitted throughout. After removing the rear aluminum cover, the whole differential gear with drive may be drawn out. The brake drums have cooling ribs on the outside. The wheels are of the pressed steel, hollow spoke type.

The front axle is the Mercedes type with an I-section center. The steering knuckle pivots are slightly inclined. Their lower end is ball-shaped and runs on a ball-shaped plate to facilitate steering.

Bearings are formed on the front axle for the two short horizontal shafts which carry on their inner ends the brake operating lever with adjusting wheel and on

their outer ends the ball-shaped cam for operating the expanding brake. The connection with the brake drum is inclosed in a leather boot.

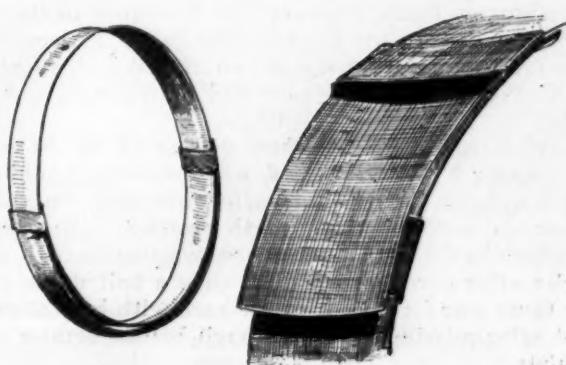
The screw of the steering mechanism is made of steel, the nut of bronze. Axial thrust is taken up by a double thrust ball bearing. At the center of the steering wheel there is a small black disk with a groove in its periphery which serves for timing the spark, and beneath it is the throttle lever. The toothed segments for locking the control are located at the lower end of the column.

The car carries 36 by 5-in. tires and has a ground clearance of $9\frac{3}{4}$ in. The weight of the chassis with tires is in the neighborhood of 3000 lb., and the car is claimed to be capable of a speed of 69 m.p.h.

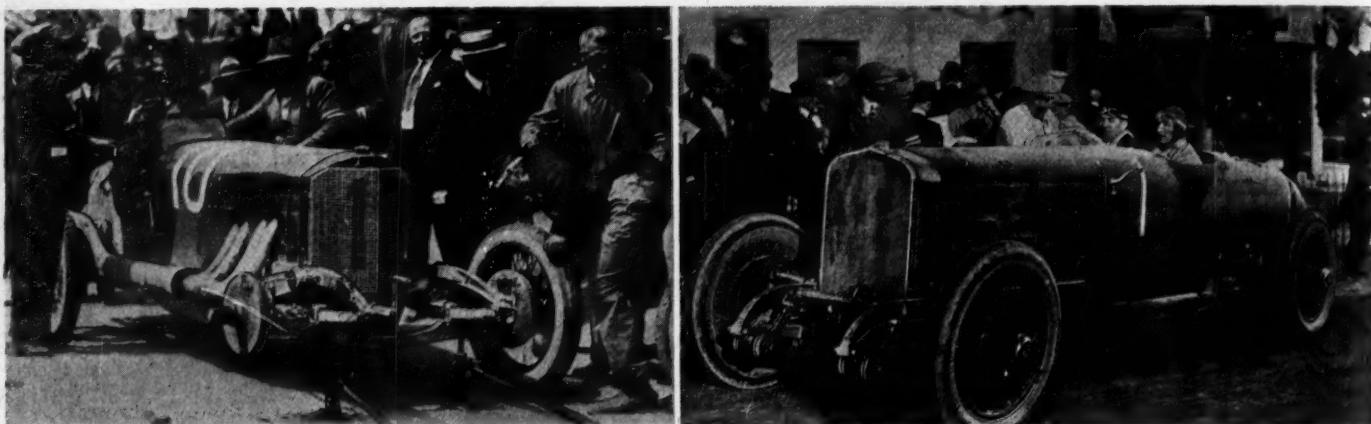
New Tire Flap Is Self-Adjusting

A NEW tire flap which, it is claimed, does away with many common troubles from pinched tubes, has been placed on the market by the Beaney Flap Mfg. Co. of 144 West Fifty-fourth Street, New York. As shown in the accompanying cut, collars attached at each end of the flap pass around the body of the flap so that the effective circumferential length is easily varied to fit any size of rim or tire. The flap adjusts itself readily, as the tire is inflated, so that wrinkles and bulges are avoided.

A NEW trade route will shortly be opened between Teheran and the Persian Gulf via Kum, Sultanabad, Khuramabad, Shushter and Mohammerah. The work of making the roads of this route suitable for motor traffic was begun some time ago.



Beaney self-adjusting tire flap



Left, winning Mercedes with front-wheel brakes stops at pits for tire change. Right, new Hispano-Suiza six had a light weight body built along aeronautic lines

Mercedes with Supercharger Engine Wins Sicilian Classic

Werner clips over 18 min. from previous record for winding, hilly 335-mile course. Air filters and dry sump lubricating systems employed on some cars entered. Those who use servo mechanisms find them advantageous. New Hispano-Suiza six seen.

By W. F. Bradley

CHRISTIAN WERNER, driving a four-cylinder 122-cu. in. supercharger Mercedes, won both the Targa Florio and the Florio Cup in a 335½ mile race over a hilly, winding and difficult 67-mile course around the Island of Sicily. Four laps of this course had to be covered for the Targa, and an additional lap for the Cup. The winner, who got in the lead after the first 70 miles, averaged 40.4 miles an hour, and clipped 18 min. 23 sec. off the best time ever made over these roads.

As the result of this race, the Florio Cup, which first was put up for competition in 1905, has been won by seven different firms, and these seven—Itala, Isotta-Fraschini, Fiat, Nazzaro, Ballot, Peugeot and Mercedes—will be united next year in a final which will determine the permanent possession of the cup.

All the competition lay between Mercedes, Fiat, Alfa-Roméo, Peugeot and Hispano-Suiza. Of the three Mercedes drivers, Werner was by far the fastest and soon left his teammates Lautenschlager and Neubauer in the rear. André Boillot put up a good fight with a sleeve-valve Peugeot, but was held up by an insufficient supply of tires in view of the fast pace and the intense heat prevailing.

Pietro Bordino, at the wheel of one of the 91-cu. in. supercharger Fiat racing cars, was overcome by the heat when he stopped at the pits after covering four of the five rounds, being then in fourth position. His car was taken over by Felice Nazzaro, who overturned with slight injuries after covering not more than a half dozen miles. Jules Goux was forced out of the race with his 183-cu. in. Ballot after missing a turn through his accelerator pedal jamming.

In addition to the value of the drivers, who comprised

all the leading Europeans, this race was interesting by reason of the high quality of the cars entered. While there were class divisions, the hilly, winding and difficult nature of the road wiped out all advantages of big piston displacement and made the small cars just as fast as the big models.

Mercedes gave very careful attention to preparations for this race and came with just the right type of car for the roads. The engine was a four-cylinder of 2.7 by 5.1 in. bore and stroke, having steel cylinder united by a common welded-on water jacket, four valves per cylinder and two camshafts, driven by vertical shaft and bevel gearing.

Supercharger Linked with Accelerator

These engines were fitted with a supercharger, the vertical compressor of which is at the forward end, driven by bevel and spur gearing. The compressor control is linked up with the accelerator pedal. The chassis were heavily built for the rough road conditions and were provided with four-wheel brakes and an emergency set of brakes in the rear wheels. Continental straight side tires were used.

The Mercedes team was under the control of Engineer Dr. Porsche, who is now in technical charge of the German factory at Stuttgart, having left Austro-Daimler to take up this position. The stock models have undergone a complete change by reason of the new technical management, and next month Mercedes will put on the market two six-cylinder supercharger cars, the smaller having a piston displacement of 244 cu. in. and the larger 366 cu. in.

In both cases the engines are unit construction with the gearbox and have overhead camshafts driven by vertical

shafts at the rear. The whole of the valve driving mechanism is enclosed, and the accessories, such as magneto, generator, water pump, etc., are under a housing. The supercharger used on the stock models is practically the same as the one on the Targa Florio racing cars. Cantilever springs and four-wheel brakes without a servo mechanism are used. There is no brake on the transmission.

The only other supercharger engines entered in the race were the Fiat 91 cu. in. models, one of which was driven by Bordino and the other by Salamano. While practicing, Salamano went off the road when both rear tires burst and was not in a condition to start. The 91 in. Fiats are last year's racing models of the same general type as the straight eight 122 in. engines. The compressor is at the forward end of the crankshaft, running at engine speed and in operation at all times.

When first used on the road, the Fiat supercharger gave trouble by reason of dust and grit being drawn into the cylinders, but this difficulty has been overcome and it is declared that the engine can run in a dust-laden atmosphere without damage to the supercharger. Air, which originally was taken in at the base of the radiator, now is aspirated by way of a ventilator cowl passing through the hood.

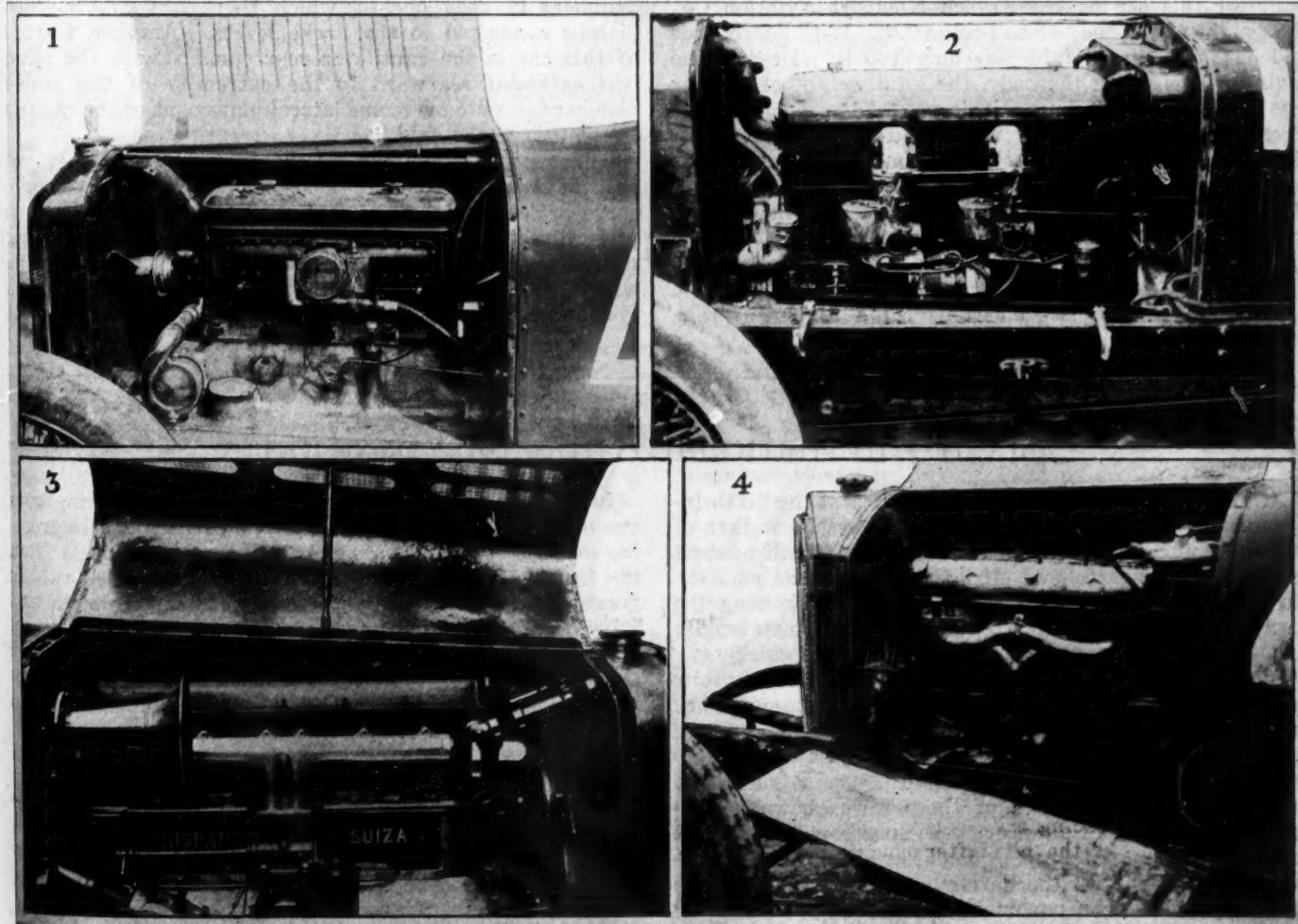
These little cars, while among the fastest in the race, are more suitable for race tracks and good roads than for Sicilian highways. Because of inability to hold them on the road, the available power could never be made use of.

The Italian Alfa-Roméo, which finished second and third with Masetti and Campari, captured eighth place with Wagner and lost one car through a momentary piston seizure, came to the line with practically a stock sport model, which made an excellent showing. A six-cylinder overhead valve engine, with pushrods, rockers and vertical valves in a detachable head, was employed. These engines had dry sump lubrication with the oil tank on the forward face of the dashboard and a double pump, one scavenging the base chamber and the other delivering oil under pressure to the bearings. This type of lubrication is being used on all the firm's stock sporting models.

Peugeot Had Dry Sump Lubrication

Peugeot employed dry sump lubrication on the modified stock model sleeve valve engines of its cars entered in this race. The change was made partially to assure better cooling of the oil and at the same time to increase the clearance under the engine. Normally, however, the sleeve valve Peugeot has its oil supply in the engine base chamber. The engines, which have 95 mm. bore and 135 mm. stroke, develop 140 hp., and the complete cars weigh 1980 lb. The German Steigers also had dry sump lubrication.

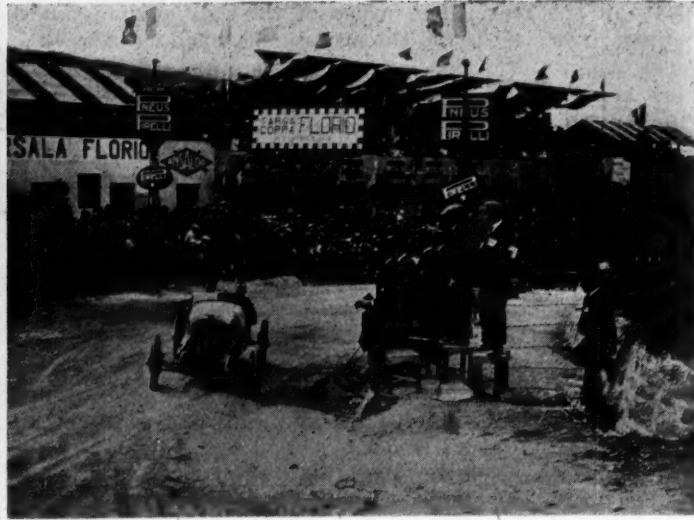
André Dubonnet came to the start with a new type of six-cylinder Hispano-Suiza just about to be put on the market. The engine used has a bore of 4.3 instead of 3.9 in. and a stroke of 5.5 in. Another change on this engine is the fitting of an air filter, the air being drawn in through a couple of breathers on the top of the crank-



Four of the engines used in the Sicilian Florio Cup race

1—Peugeot 95 x 135 mm. four-cylinder, said to develop 140 hp.
3—Hispano-Suiza 110 x 140 mm. six fitted with air cleaner which acts also as an oil cooler

2—Alfa-Roméo six with overhead valves and dry sump lubrication
4—Mercedes 122 cu. in. four with supercharger just back of radiator



Two views on the Florio Cup race course. Pits were located on a side road. Winning Mercedes rounding a turn is seen in the view at the right

case webs and carried through passages in the base-chamber to the carburetor. On this engine all the air drawn through the radiator is expelled through the sides of the hood, for the crankcase webs are flush with the frame members and the dash is a tight fit with the engine base.

A special all-wood copper-riveted four-seater body was built for this car by the French Nieuport Aviation Co., the weight of the body alone being 99 lb. With floorboards and cushions, the weight was only 165 lb. Despite the saving of weight on the body, the total weight of the car was more than 4000 lb., and this proved too much for the tires at racing speeds over these roads. Dubonnet led at the beginning, but owing to numerous tire changes was forced back to fifth place at the finish.

The Hispano-Suiza was one of the few cars in the race with a servo brake, although all others had four-wheel brakes. Undoubtedly a servo gave a decided advantage by reason of decreased physical effort required from the driver, and as a consequence enabled a higher average

speed to be maintained. Drivers who have had experience with both types were emphatic in their appreciation of the servo mechanism in a race which undoubtedly is the hardest in the world on brakes.

One of the stock six-cylinder Fiats made use of the firm's hydraulic servo brake. This comprises a pump in the lower portion of the gearbox, delivering oil to two cylinders in each one of which there are two opposed pistons connected to the brake levers. Another feature of this car is the cantilever rear springs with the main leaf extended rearward to the extremity of the frame members so as to overcome lateral movement of the chassis in relation to the axle.

The car held the road excellently and apparently got real advantage from its suspension and its hydraulic servo brake, for when it went out with a damaged clutch after three hundred miles it was the only one not having made a tire change. There was a certain amount of trouble with clutches among the different competitors, the Hispano-Suiza also being held up for ten minutes.

Sixth International Rubber Exposition

FOREMOST among the Belgian displays at the Sixth International Rubber Exhibition in Brussels, is that of O. Englebert Fils & Cie., manufacturers of the Englebert balloon tire, which follows Michelin as closely as possible. No other manufacturer at the exhibition is showing the 31 x 4.40 clincher balloon tire, and there is some surprise that Englebert has gotten it on the market so quickly.

One of the most complete of the manufacturers' exhibits is that of O. & R. Cheysen Frères & Cie., whose factory is near Brussels. The company offers a full range of cord tires for automobiles, motorcycles and bicycles. The company makes a specialty of pneumatic tires for trucks and buses, and several samples of these were shown accompanied by the Pare-Boues, or "anti-splashes," which the company also manufactures. The Pare-Boues are manufactured primarily for the Parisian market, where a traffic law compels buses on pneumatics to be equipped with an "anti-splash" device.

Omitting the American exhibits, the exhibits of British rubber manufacturers would take rank next after the Belgian.

In the Malayan exhibit appear rubber products from the Singapore rubber factories. The articles are interesting because of their faults. The principal showing is from the factory of Tan Kah Kee and comprises molded rubber goods for a variety of purposes but principally soles and heels, molded soles on canvas uppers and automobile mats.

In the absence of displays from France, Austria and Germany, however, there is no chance to form a completely settled idea of how the rubber industries of the various European countries compare.

IN rectifiers of the vibrator type there is a tendency for metal to be transferred by the current from one contact point to the other. This effect is troublesome, as little protuberances may be formed on the points, which prevent the establishment of good electric contact, and sometimes the contact points actually become welded together. A Swiss inventor now claims to have discovered that if the two contacts are made of dissimilar metals (silver and tungsten for instance) this difficulty is obviated.

Automobile Titles Should Be Treated Like Deeds to Real Estate

Automobile thefts have been reduced 50 per cent in States which have certificate of title laws. Similar legislation is recommended for all States which should contain adequate provision for enforcement and penalties for violation.

DURING the past few years automobile thefts in the United States have assumed alarming proportions. When motor vehicles were comparatively scarce a stolen machine could be easily traced and recovered, but with well over 15,000,000 cars and trucks registered in this country in 1923, representing 85 per cent of all those in the world, our problem is serious.

Data have been collected on the subject by the Insurance Department of the Chamber of Commerce of the United States, and a resolution was passed at the recent meeting of the body favoring certification of automobile titles in all the States which have not already passed such laws. The U. S. Chamber of Commerce survey reads in part as follows:

Estimates indicate that cars valued at from \$100,000,-000 to \$150,000,000 were stolen in 1922. In light of the fact that there are 131 motor vehicles on the average for every thousand persons in this country, it will be readily seen that the hazard of loss of property through automobile thefts affects a great portion of our citizens. Most of the reported thefts occur in cities and among pleasure car owners. Comparatively few have been experienced in rural districts or among commercial car owners.

As a majority of the various types of cars are practically standard as to general appearance it is not difficult for thieves to escape unnoticed with them, even though some may be of large value. The largest proportion of thefts, however, occurs among the lower priced cars.

Through stories told by thieves, aided by fictitious or stolen bills of sale, there are many innocent purchasers of stolen cars. Some stolen machines not disposed of in this country are transported across the Canadian border and sold, while others are shipped to Europe and South America. Therefore the outstanding factors which aid in the distribution of stolen machines are first, the good market for second-hand cars, and second, the non-standard methods of transfer existing in many States.

Two Classes of Automobile Thefts

Automobile thefts may be divided into two general classes; first, those which are made solely for purposes of sale; and second, those for individual use. In the former, recovery is more difficult because the thefts are generally committed by professional thieves.

Theft syndicates have been found to exist in many of our larger cities. In fact, some of them have been said to be international in character. They are formed for the purpose of stealing, disguising, transporting and selling automobiles.

When cars are stolen by their members they are often taken to syndicate garages. There the identification num-

bers are removed and new ones substituted. Tires and various parts may be interchanged with those of other stolen cars and in some cases the machines repainted. When the alterations are completed the cars may be sold locally, in other States, or in foreign countries.

The statement has been made that many of the cars stolen in New York City are put on board ship and leave New York harbor bound for a foreign port before the thefts are even reported to the police. Although a large number of cars are stolen by organized and individual professional thieves, many machines disappear through the efforts of persons who may wish to steal a car, either to fill some temporary need or for permanent use. Records show that many of the crimes of the present day are committed in stolen cars.

A bandit may steal an automobile, perpetrate a crime and abandon the machine before it has been reported stolen. Some cars are in all probability stolen for personal permanent use.

Joy Riding a Great Source of Trouble

An aggravating source of trouble to the police forces of our great cities has been the theft of cars for "joy-riding." Young people, desiring the thrill of a fine car, will often steal an automobile and abandon it later. It has been estimated that in some of the large cities "joy-riders" and bandits are responsible for over 50 per cent of the cars stolen.

A source of much trouble and expense to automobile insurance companies is the tendency on the part of some persons whose automobiles are insured to dispose of them and then claim the cars have been stolen. In some instances pits filled with water have been used as dumping grounds and when drained or dredged have revealed scores of cars concealed by the owners in order to collect insurance. Owners of heavily mortgaged automobiles have also been known to sell their cars in distant cities and then report them as lost by theft.

Many attempts are being made to combat the automobile theft problem. These may either tend to prevent thefts or to assist in recovering cars which have been stolen. Owners whose machines are equipped with locking devices neglect at times to use them. Since the use of locks may delay the professional thief or defeat the amateur, some States have made it illegal to leave a car unlocked upon city streets.

Devices providing for the stamping of some identification mark upon a conspicuous part of the machine has been tried, but cases have been known where the identification mark has been altered or disguised or the part containing it replaced. For example, in one case where a

TREAT AUTOMOBILE TITLES LIKE DEEDS

Automotive Industries
May 22, 1924

number had been stamped upon the gasoline tank a new tank was substituted. For the purpose of identifying cars whose numbers have been changed, certain methods of restoring defaced or mutilated factory numbers have been recently developed.

A new method of recording ownership is being advocated by a recently formed organization known as "The United States Bureau of Automobile and Airplane Identification." This is a copyrighted plan and the service is rendered only to members of the organization.

Various Practices for Recovery

The National Automobile Underwriters' Conference, representing a number of the larger companies writing automobile theft insurance, maintains detective bureaus which endeavor to recover stolen cars. In conjunction with the Department of State it is now interested in simplifying the procedure for recovering cars stolen in the United States and sold in Canada.

In some cities a record is made on the police card index when a car is reported stolen and telephone messages and telegrams are sent immediately in an effort to recover it. Daily, weekly and monthly bulletins are circulated among many of the principal cities of the country by municipal police departments.

The Federal Government, realizing the seriousness of the situation, passed in 1919 an act known as the Dyer bill, which makes it illegal to transport or assist in the transportation of any stolen vehicle in interstate commerce, and provides punishment for those found guilty of such action. While the Dyer bill does not cover the theft and sale of a machine within a single State, it does concern itself with interstate traffic in stolen machines. Since the law became effective in 1919, agents of the Bureau of Investigation of the United States Department of Justice have recovered 4792 automobiles with an estimated used-car value of \$4,970,860.

Although it is recognized that each of the agencies which have been listed has done something toward checking motor thefts, none of them has

been successful in entirely remedying the situation. It has been stated that one reason losses continue to take place is the ease with which automobiles may be transferred in some States.

In order to place the burden of proof regarding ownership upon the possessor of the automobile, a number of States have passed so-called title certification or automobile anti-theft laws. This type of legislation is comparatively recent, the first title law having been enacted in Virginia in 1919.

The principal feature of the title certification law is that every car owner in the State must secure and possess a certificate of title proving his ownership of the vehicle in question. In order to register a motor vehicle for the

PRINCIPAL PROVISIONS OF STATE

State	PROVISIONS																
	Title certificate					Transfer and junking of automobiles		Theft prevention and recovery									
State	Requisite to automobile registration	Full statement of liens, etc., required in application	Inspection of vehicle before issuing certificate	Special certificate for dealers	Cost of certificate	Distribution of funds	Title assignment and issuance of new certificate in event of transfer	State to keep transfer of ownership file	Notification to state by owner when car is junked	Illegal to leave car unlocked on streets	Licenses required for second-hand dealers	Garagekeepers and dealers to make report on all cars stored	Sheriff to seize cars with altered numbers	Sheriff to report all stolen and recovered automobiles to state	State to compile lists of stolen and recovered cars	State to file list of cars stolen in other states	State to publish lists of cars stolen
Alabama	Yes	Yes	No	Yes	\$1	1. Expenses. 2. Law enforcement. 3. General Treasury.	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes
California	Yes	No	No	Yes	.....		Yes	No	No	No	Yes	No	No	No	No	No	No
Colorado	Bill of Sale	No	No	No	.....		Title assigned	Yes	No	No	Yes	Yes	Yes	No	No	No	No
Delaware	Yes	Yes	No	Yes	\$1	1. Gen. exp. 2. Theft prevention	Yes	Yes	No	No	No	No	No	No	No	No	No
Florida	No	Yes	No	Yes	\$1	1. Expenses. 2. Roads	Yes	No	No	No	Yes	No	No	Yes	Yes	Yes	Yes
Indiana	Yes	Yes	No	Yes	50c	1. Expenses. 2. Theft prevention	Yes	No	No	No	No	No	Yes	Yes	Yes	No	No
Maryland	Yes	Yes	No	Yes	\$1	1. Expenses. 2. Theft prevention	Yes	Yes	No	Yes	No	No	No	No	No	No	No
Michigan	Yes	Yes	No	Yes	\$1	1. Expenses. 2. Highway Fund	Yes	Yes	No	No	Yes	No	No	Yes	Yes	Yes	Yes
Missouri	Yes	Yes	No	Yes	\$1		Yes	No	No	(a) Yes	No	Yes	Yes	No	No	No	No
No. Carolina	Yes	Yes	No	Yes	50c	1. Expenses. 2. Law enforcement	Yes	Yes	No	No	Yes	No	No	Yes	Yes	Yes	Yes
Ohio	Bill of Sale	No	No	No	.....		New bill of sale	Yes	No	No	No	No	No	No	No	No	No
Pennsylvania	Yes	Yes	No	No	\$2	1. Expenses. 2. Highway Fund	Yes	Yes	No	No	No	No	Yes	Yes	Yes	No	Op. optional
Utah	Bill of Sale	No	Yes	No	.....		New bill of sale in trip.	No	No	No	No	No	No	No	No	No	No
Virginia	Bill of Sale	No	No	No	.....	1. Enforcement. 2. State Treasury	New bill of sale	No	No	Yes	No	No	No	No	No	No	Unlawful
Wyoming	Bill of Sale	No	No	No	.....		Title assigned	Yes	No	No	No	No	Yes	No	No	No	In cities of more than 75,000 population.

b—Possession of auto with altered numbers

purpose of securing a license, the owner in most States must show this certificate. In the event the car is resold, an assignment of title is made and the new title recorded by the Secretary of State or other official.

It will be observed that there is a decided similarity between such certificates of title and deeds to real estate. Both the deed and the certificate of title are evidences of ownership and no legal transfer can be made without recording them. A person would not consider purchasing a house or lot to which he could not secure a deed. Likewise in States which have title laws, a man would not ordinarily buy an automobile without an accompanying title certificate.

In addition to the provisions contained in the various

title laws for the issuance of title certificates or bills of sale to all automobile owners and the assignment of title in the event of transferred ownership, numerous other requirements have been incorporated. Among these are provisions to help prevent thefts, make more difficult the transfer of stolen machines and aid in their recovery.

Full Statement of Liens Required

A full statement of liens against the vehicle in question must accompany applications for certificates in nine States. Nine of the fifteen States having this legislation require the Secretary of State or some other official to keep a transfer of ownership file. Nine provide for a special title certificate to be issued to dealers and five require licenses for second-hand dealers. Six laws prescribe that the State must publish lists of cars stolen and recovered. These are distributed not only to cities within the State, but also to the proper authorities in other States.

Various penalties for violating provisions of the acts are generally included. Some pertain to actual thefts and alteration of identification marks. Others deal specifically with attempts to own, operate, sell or purchase cars without accompanying certificates of title. A chart showing in detail the principal provisions and penalties of the existing certification of title and anti-theft laws is reproduced here.

As with all legislation, the value of title certification laws depends upon their enforcement. Although the actual provisions for this may differ somewhat in various States, in most cases the responsibility is placed upon the Secretary of State, Motor Vehicle Commissioner or other State authority who is aided by police forces and special deputies. States which have adopted these laws and provided that a certificate of ownership is essential for registration report, practically without exception, that the laws are strictly enforced.

More than two-thirds of the States have not as yet passed certificate of title laws. A criminal, therefore, may steal a car in a State having a law of this kind and sell it in a neighboring State which does not have such rigid

CERTIFICATION OF TITLE LAWS

PENALTIES

Title certificate		Transfer and junking of automobiles	Theft provision and recovery				General		
State to publish lists of cars stolen	Operating automobiles without certificate	Forging or altering certificate	Sale of automobile without certificate	False statements in application or knowledge of stolen car	Alteration of identification number	Purchase of auto with altered numbers	Sale of auto with altered numbers	Violation of provisions of act not otherwise specified	False swearing in regard to act
Yes	\$1-\$1,000	\$100-\$5,000 and/or 1-5 years	Not over \$500 and/or not over 12 months	\$100-\$5,000 and/or 1-5 years			Not over \$500 and/or 12 months		Perjury
No	Misdemeanor	Misdemeanor		Misdemeanor		Unlawful	Unlawful	Misdemeanor	Misdemeanor
No		Not over \$1,000 or 1-10 years	Not over \$500		2-5 years	1-10 years or \$1,000	1-10 years or \$1,000	Not over \$300 and/or 90 days	
No	\$1-\$1,000	\$1,000-\$5,000 and/or not 1-10 years	\$5-\$1,000 and/or not over 10 years	\$500-\$5,000 and/or 60 days-5 years	Not over \$1,000 and/or 7 years	\$5-\$1,000 and/or not over 7 years	Not over \$1,000 and/or 7 years		
Yes	\$1-\$100	Not over \$500 and/or 1 year	\$10-\$100 and/or not 90 days	\$10-\$100 and/or 90 days					Perjury
No	\$1-\$1,000	\$1,000-\$5,000 and 2-10 years	\$100-\$1,000 and 2-10 years	\$500-\$5,000 and 2-10 years	\$100-\$1,000 and 2-10 years		\$100-\$500 and 30-180 days		
No	\$1-\$1,000	\$1,000-\$5,000 and/or not 1-10 years	\$5-\$1,000 and/or not over 10 years	\$500-\$5,000 and/or 60 days-5 years	Not over \$1,000 and/or 7 years	\$5-\$1,000 and/or not over 7 years	Not over \$1,000 and/or not over 7 years		
Yes	\$1-\$1,000	Not over \$5,000 and/or not more than 10 years	Not over \$1,000 and/or not more than 10 years	Not over \$5,000 and/or not more than 10 years	Not over \$100 and/or 90 days				Perjury
No			Unlawful	Not over \$100 and/or not more than 5 years	Unlawful	Unlawful	\$5-\$500 and/or not exceeding 2 years		
Yes	\$1-\$1,000	\$100-\$5,000 and/or 1-5 years		Misdemeanor	\$100-\$5,000 and/or 1-5 years	Misdemeanor	Misdemeanor		Perjury
No	\$50-\$5,000	\$50-\$5,000 and/or 5 years	\$25-\$5,000	\$50-\$5,000 and/or 5 years			\$25-\$5,000 and/or 5 years		
No	\$1-\$1,000	\$1,000-\$5,000 and 2-10 years	\$100-\$1,000 and 2-10 years	\$500-\$5,000 and 2-10 years	\$100-\$1,000 and 2-10 years		\$200-\$500 and/or 30-180 days		
No			Unlawful		Unlawful	Unlawful	\$25-\$1,000 and/or 30-90 days		
No			Unlawful	Not over \$500 and/or 12 months	Unlawful	Unlawful	Not over \$500 and/or 6 months		
No		1-10 years	Not over \$500		1-10 years		Not over \$500 and/or 6 months		

*In cities of more than 75,000 population.

†Purchase of auto with altered numbers.

legislation. This naturally prevents a title law from operating to its maximum efficiency. In recognition of the desirability for uniform legislation in all States on this subject, a suggested anti-theft law has been prepared and widely circulated by the National Board of Fire Underwriters.

Officials of Maryland and Michigan report a 50 per cent reduction in theft losses since their laws went into effect. Insurance companies, through a reduction of rates in some States, have taken cognizance of this legislation. The Southern Automobile Conference, with jurisdiction in the South Atlantic States, has granted a 10 per cent reduction in Florida, North Carolina and Alabama because they have enacted title laws. It will also grant corresponding reductions in other States within its jurisdiction which adopt similar legislation.

Law First Became Effective in 1919

Although the oldest of the 15 laws now on the statute books of the various States have been in force about four years, many of them have been enacted quite recently. The date when each became effective follows:

1919, Colorado, Virginia; 1920, Maryland; 1921, Indiana, Michigan, Missouri, Ohio and Utah; 1923, Alabama, California, Delaware, Florida, North Carolina, Pennsylvania, Wyoming. 1924 will show further additions to this list, including South Carolina.

Owing to the limited experience under these laws, their reduced efficiency when surrounding States do not have similar legislation, and the lack of adequate data, it is difficult to measure accurately by statistical processes their efficiency in combating the theft problem.

Opinions from various officials in States having such laws may, however, be presented as indicative of the trend of thought relative to them.

B. O. James, Secretary of the Commonwealth of Virginia, states: "I can say off hand more than 1500 cars have been recovered, that the theft of cars has been materially reduced. Through the operation of this law we have placed in the State penitentiary a number of professional thieves, some of them members of gangs that stole as many as 1000. Two of the thieves are responsible for several hundred cars."

E. Austin Baughman, Maryland State Commission of Motor Vehicles, says: "Operation of the Maryland Title Law, enacted in 1920, continues to justify this method of safeguarding the ownership of all motor vehicles in Maryland and of giving this department a complete record of the cars and their owners. These records have been of great assistance to the police in apprehending the perpetrators of hold-ups and bank and payroll robberies."

Maryland's Theft Rate Cut in Half

Andrew B. Linhard, State Registrar of Titles, writes: "May I call your attention to the fact that in 1920 the theft rate was practically cut in half, and that the number in the Missing Column grows steadily smaller year by year, despite the fact that there has been a 20 per cent increase yearly in the number of cars on the street since 1920. During the past year there was a large number of cars stolen, but these have been quickly recovered, only 57 remaining 'out.'"

E. V. Chilson, Deputy Secretary of State, Lansing, states that: "As a matter of fact, the Michigan Title Law has been successful in every way, both in the prevention of stolen cars and the recovery of stolen cars and as a deterrent to thieves and crooks."

E. J. Stankhard, Chief of Police, Elyria, Ohio, reports that: "This law has been the means of lowering the theft of automobiles in this city about 60 per cent, as it is impossible for the thief to dispose of the automobile without

the bill of sale in this State. A nation-wide law of this nature I believe would almost eliminate the automobile theft. As it is, in this State it has been a big addition to the officers of the law in running down stolen automobiles."

Pennsylvania Law Recent

Benjamin G. Eynon, Registrar of Motor Vehicles, Harrisburg, Pa., states that: "Owing to the fact that this law only became effective in Pennsylvania on Nov. 24, we have had very little opportunity to estimate the effect in decreasing motor thefts; but we have learned from statistics available from other States having this law in operation that such thefts have been reduced by from 40 to 75 per cent, and we have no doubt that the same results will be apparent in Pennsylvania as soon as the full force and effect of the law is felt."

"Of course, the ultimate aim of those interested in modern motor legislation is to see a similar law enacted in all of our States."

An attempt was made to ascertain the opinions of officials in States wherein such legislation does not exist. The following extracts are from the replies obtained.

James H. Kerby, Secretary of State, Phoenix, Ariz., is authority for the statement that: "Arizona will undoubtedly amend its Motor Vehicle Law at its next session of the Legislature, and I will recommend this Motor Vehicle Title Law."

Robbins B. Stoeckel, Commissioner of Motor Vehicles, Hartford, Conn., is alone in a protest against it. "I do not think that such legislation is efficacious. The reason why I do not approve of it is that it depends entirely upon the honor and honesty of the man who makes the return to the State Department and, of course, in the case of a thief that element is absolutely lacking. In those States which already have such a law I have had no difficulty at all in securing registrations for fictitious cars where I wanted to test it out, and I think this department is at present a holder of a registration for a fictitious car in Indiana which we took out at the time the last legislature was in session to prove that the law was not efficacious. It might be useful and worth having if all the States should adopt it, otherwise I cannot see how it is of any use."

Approval All But Universal

Practically all interested in the question of automobile thefts give unqualified approval to certification of title laws. Such measures are indorsed and advocated by the Motor and Accessory Manufacturers Association, National Automobile Chamber of Commerce, National Board of Fire Underwriters, Rubber Association of America, Trailer Manufacturing Association of America and many insurance companies.

The certification and registration of automobile titles is one of the most important and effective means for reducing thefts. The adoption of suitable anti-theft legislation which puts an automobile title on the same basis as a deed is recommended for all States. This should be uniform in principle, contain adequate provision for enforcement and proper penalties for violations.

A MARKET analysis made in Cincinnati has shown that there is more buying power for automobiles among the "overall" workers than among the "white collar" workers, in the proportion of 2½ to 1. This probably is not due to the former actually earning more money than the latter, but to the fact that the "man in overalls" has less personal expenses, can afford to live in a neighborhood of lower rents, and does not feel compelled to spend so much for the education of his children.

Chevrolet Course for Salesmen Follows Correspondence School Methods

Enrollments already exceed 5,000 and probably will be double that number by July. Instruction sticks to facts and provides practical help in making sales.

By D. M. McDonald

In the eight weeks since the announcement and inauguration of the Chevrolet Motor Co.'s correspondence course in retail selling, 5466 enrollments have been received. At no time since the announcement of the course have there been less than 100 enrollments every day, and lately the daily average has been over 200. By July the company looks for an enrollment in excess of 10,000, and a final total of 40,000 is expected.

The course is limited chiefly to those in Chevrolet employ, and while designed specifically for dealers' salesmen, will be given to any employee who has any connection with selling or who may wish to prepare for sales work. The company's theory is that everyone connected with its dealers or service stations should have knowledge of merchandising. Persons recommended by dealers who wish to become Chevrolet retail salesmen also are permitted to receive the instruction.

One wing of the General Motors Building has been given over to the school and to offices for C. R. Santee and his corps of assistants who are in active direction. Regardless of the number enrolled, a system of handling the papers and examinations has been set up which will permit immediate attention, thus enabling the student to conclude the course in a given period, which, however, is not obligatory, though recommended.

The course is divided into fifteen parts. Some of the students already have passed to the fifth, and in some cases sixth, of these. The majority, however, are still in the first two or three lessons, which are titled: "Why Study This Course?" "Principles of Selling," and "The Market for Automotive Transportation."

As indicated by its title, the first part deals with opportunities opened to salesmen through study and application. Ten questions are asked in examining the student as he concludes each part. Some of the questions of Part 1 are: "What are the chief requirements for success in any undertaking? What are the chief qualifications of a salesman? Have you a savings account? What is the greatest amount you ever earned in one year?"

Part No. 2, "Principles of Selling," concludes with the following questions:

What is the basis of selling?

How are commodities classified for selling?

What is the difference between a utility and a luxury?

THIS article tells specifically how one big automobile company is helping its dealers to sell more cars.

meets it. State a luxurious feature of Chevrolet.
Describe a principal usefulness of the Human Nature analysis chart.

The lessons are cumulative to a certain extent, making it necessary for the student to achieve satisfactory marks in each lesson if he is to make sound progress through the course. Papers submitted by students for that reason are examined carefully, and where it is evident the student has not made the progress in the lesson that is necessary for success with the course generally, the paper is returned, with suggestions for re-study. Until each group of questions is answered satisfactorily the student is not permitted to go on.

Lessons are mailed two at a time, except to students west of the Rockies, who get three at a time. This permits the student to have one lesson before him at all times. On concluding the first and mailing his answers, he goes into the second. While he is studying this, his papers on the first are checked over. If satisfactory, the third course is mailed with the returned first papers. If unsatisfactory, the papers are sent back and the student is required to go over the first part again. This follows regular correspondence school practice in the main. On completion of the course and the achievement of satisfactory marks, a diploma is awarded.

Under the heading, "More Aggressive Selling Needed," which is contained in the third part of the course, the company outlines its position in developing the correspondence school. It says: "The time has come for raising the standard of all Chevrolet retail salesmen. We want only such men as insist on big earnings, and are willing to work to get them. Many salesmen who have made \$1,500 to \$2,500 a year receiving orders for Chevrolets in 1922 and 1923 can and will earn double and treble these sums in succeeding years."

"This course is one of the means to help them lift themselves to this higher earning capacity and perhaps to prepare for much larger returns as Chevrolet dealers."

"Men with such ambitions and aims will study and realize the great undeveloped market for Chevrolets."

They will analyze localities now open, in which there are no Chevrolet dealers, and see how easy it would be to sell 200 to 300 cars a year in each such locality. There are today hundreds of such places. We want you to realize your own possibilities, because it is through you and your fellow salesmen we must attain ours. We want to see you double and treble your earnings."

In the succeeding parts the course carries the student through the general mechanical features of the Chevrolet car, outlines general selling points, gives complete description of all models, tells how to analyze the market, describes the possibilities for commercial car business, tells about advertising policies and how they may be coupled up with active selling. Under the heading, "Why Salesmen Should Study Chevrolet Advertising Carefully," it says:

Advertising Defines Current Policy

"Our advertising copy is not prepared far in advance. It is written as needed, rarely more than one month ahead of the date of publication, in order that it may reflect the latest viewpoint, policy and conditions of our business and the market. Salesmen may, therefore, consider the advertising as the expression of the current policy of the sales executive in our relations with the public.

"If current advertisements feature quality, that is what the salesman should do. If economy is presented strongest, he should stress economy. If service is the main topic in the advertising, he should feature service. The sales executives are in close touch with the market and with competitive methods. The advertising attack is varied from time to time to meet our operating and sales requirements and external conditions. Strong reasons usually dictate these changes, and the best results are obtained when all factors of our sales effort are operating along the same line."

The reception of the course by the dealer organization has been most favorable, as the total enrollments would indicate. To stimulate dealers, however, who have not responded with enrollments from themselves and

their salesmen, the company is reproducing a few of many testimonial letters which it has received. One of these, from W. W. Vance of Vance Motor Co., an Oklahoma dealer, outlines the general attitude. It follows:

"We want to commend you folks on this salesman's course. It is positively the best method of development for salesmen that we ever saw, after looking over the course thus far.

"To show you how earnest this company is with reference to it, we have made it a positive requirement that every one of our sales force take the course and complete it with flying colors to stay with this organization. In other words, it is a requirement for employment with this company, and our salesmen so understand it."

A letter from a salesman for a Lexington, Ky., dealer is quoted by the company as illustrating the value of the course if it is properly used. The salesman writing the letter has received high marks on all papers sent in. His letter follows:

"Just a few lines that may be of interest to you. It is my desire to inform you of the method pursued by myself in studying the course, 'Merchandising Chevrolets.' First of all I give each lesson two hours each night for three nights, studying each paragraph thoroughly. By the end of the third night I have the entire lesson in my mind to such an extent I could very nearly say it verbatim.

Attributes Three Sales to the Course

"I never answer the questions to a lesson until I have received the previous lesson and have noted the corrections made by yourselves, and have read over that corrected lesson again to freshen my memory as to each subject contained therein.

"I make it a point to put into use the principal points in each lesson on my prospects to see its actual effect.

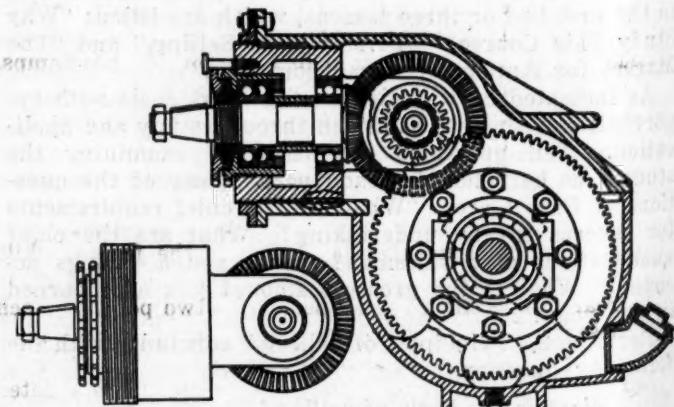
"In the past week I have closed three sales that I take pride in attributing directly to your course. It is my sincere belief that I never would have been successful in making these sales except for the wonderful methods set forth in 'Merchandising Chevrolets.'

A New Double-Reduction Axle Design

PATENTS recently have been granted to Austin M. Wolf of Plainfield, N. J., on a double reduction axle design in which the two bevel gears and the spur pinion of the secondary reduction are mounted in a carrier unit which is movable axially in order to facilitate ready adjustment of the spur pinion in reference to the spur gear. This makes it possible to mount the spur gear in exact alignment with the live axles and also to provide a first reduction unit which can be assembled outside the axle and thereafter be placed in or readily taken out of the main axle assembly.

As shown in the accompanying cut, the bevel pinion shaft is mounted in conventional fashion and in such a way as to permit of correct positioning in reference to the bevel gear. This adjustment is made with the carrier unit outside the main axle housing. The carrier unit is of cylindrical form at its forward end, but is provided with arms which extend rearwardly to support the bearings for the shaft which carries the bevel gear and spur pinion. This unit is adjusted axially by a threaded collar which is locked when adjusted to the axle housing, or if desired, by use of shims between an integral collar and the housing.

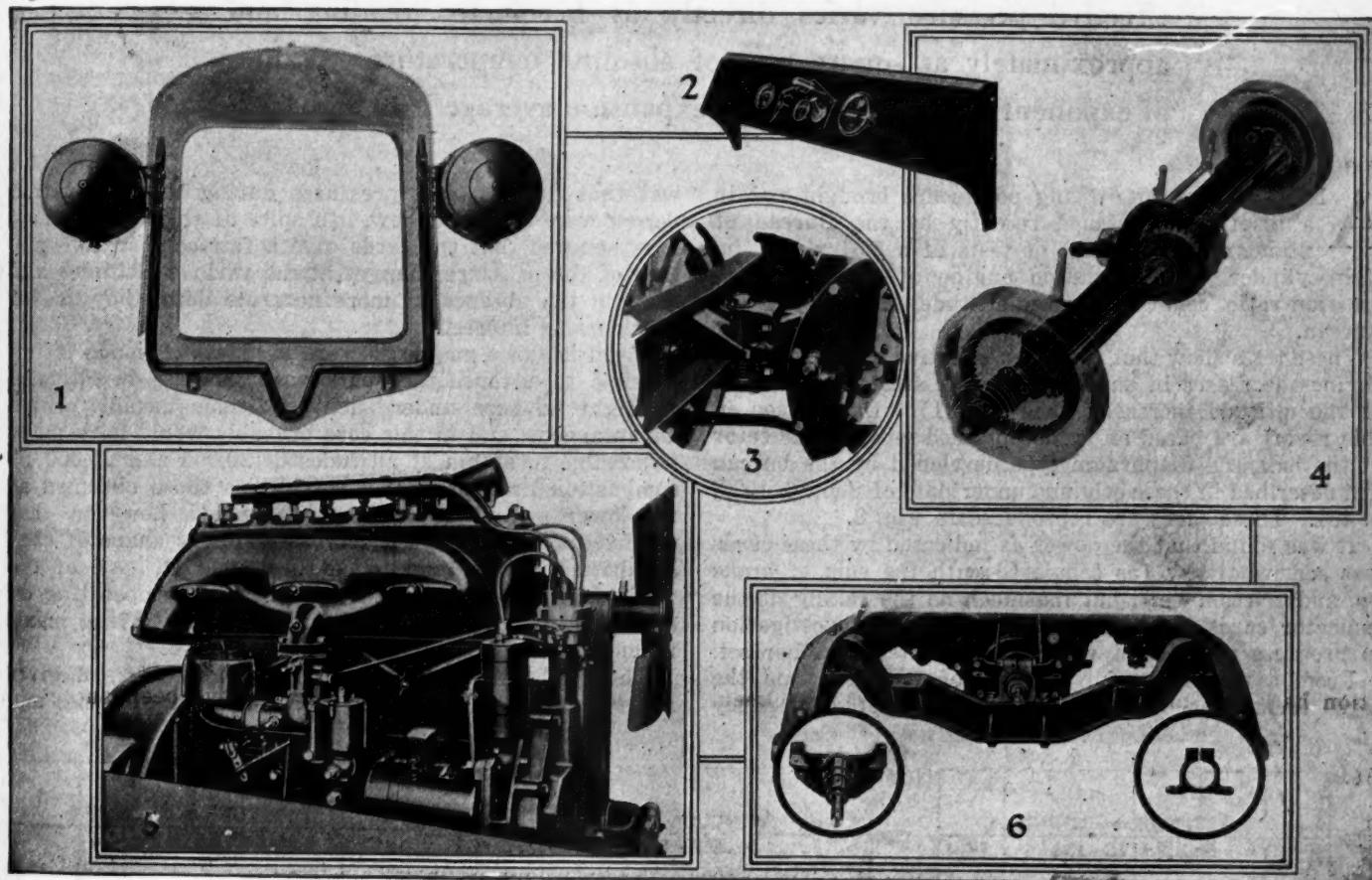
The carrier is turned on its outer diameter to fit the bore of the housing and is keyed to prevent it from turning in this bore.



Double-reduction axle with removable bevel gear and spur pinion carrier unit, designed by Austin M. Wolf

Republic Strengthens Frames of All Trucks and Makes Other Improvements

On the "Rapid Transit" model the radiator design has been changed to improve appearance, instrument board has been rearranged, and cylinder head allows for quick carbon removal and valve work.



1—Combined radiator core and headlamp support. 2—Instrument board. 3—Rear universal engine support with spring hold-down. 4—Internal gear drive rear axle. 5—Engine, showing installation of air cleaner. 6—Front engine support and removable nose

A NUMBER of detail improvements have been made in the Republic "Rapid Transit" model. The radiator design has been changed to improve the appearance and strengthen the radiator support. A drop forging fits inside the shell and acts as a bracket for the headlamps, as well as strengthening the shell. The headlamps are held by a tie rod on the outside, and the radiator support acts as a carriage for the radiator core, which does not fasten to the shell and consequently is not subjected to frame stresses.

A removable nose has been placed on the engine. The front cross-frame member is riveted to the frame, while the engine nose fastens to it with two removable bolts. The rear of the engine is suspended at two points. Each of these points of suspension are of the universal type, and each has a spring which allows the support to absorb road shocks and prevents frame wear being communicated to the crankcase. By removing the engine nose the engine can be taken quickly from the chassis.

The ignition system now is grouped at the front end of the engine with the coil and distributor head well up and

away from grease and dirt. The carburetor also is raised so that it is easy to get at, and a United air cleaner is used in connection with the carburetor. The detachable cylinder head allows quick access for carbon removal and valve work.

Each bearing of the four-cylinder, five-bearing engine is mounted on a rigid web, and the lubrication system gives full pressure to all main and connecting rod bearings.

The instrument board is of a new design, so arranged that the instruments are in line with the driver's vision. The instrument board also serves to protect the wiring from the weather.

The chassis frame is heavier and deeper and an internal gear drive axle is used. This axle has an I-beam, which carries the load and body weight.

On the heavier model Republics a driveshaft brake is used, this brake being fastened to the center cross-frame member and operated by two contracting shoes, both of which are removable for relining.

The frames of all models have been strengthened and each model is made in several wheelbase lengths.

Effect of Altitude on Engine Power Revealed by Bureau Tests

Experiments in Government laboratory show that indicated mean effective pressure varies directly as barometer reading and approximately as square root of absolute temperature. Values of exponent of compression and expansion average 1.39 and 1.22.

A NUMBER of interesting points are brought out in a brief report issued recently by the Bureau of Standards as a result of tests of a 5.51 x 5.91 in. eight-cylinder V-type aviation engine of 5.6 to 1 compression ratio, conducted in the altitude laboratory at the Bureau.

These tests show that the mean effective pressure of the engines decreases in an approximately straight line ratio as the altitude increases (See Fig. 1). Data given in this report are based on cards obtained with an indicator of the balanced diaphragm type developed by the bureau and described in these columns under date of Sept. 6, 1923, p. 484. These cards are reproduced in Fig. 2.

It was found that the power as indicated by these cards was somewhat low (as compared with the sum of brake hp. and friction hp.), but inasmuch as the taking of the indicator cards was only incidental to the investigation in progress no attempt was made to obtain another set.

From a rather careful scrutiny of test data and the cards themselves, it appeared that the chief discrepancy

was that the apparent pressures during the combustion period were somewhat low. In spite of this discrepancy, it is believed that the cards give a fair comparative picture of the pressure changes at the various altitudes and that, in the absence of more accurate data, they are of considerable interest.

Fixed advance magnetos were used, which made it impossible to advance the spark with increase in altitude. A slight advance under such conditions usually proves advantageous, and in this case probably would have made it possible to obtain at altitudes of 20,000 and 25,000 ft. combustion lines as nearly vertical as those obtained at the lower altitudes. It should be noted, however, that the fixed advance gives a very satisfactory shape of card at altitudes up to and including 15,000 ft. All of the cards shown were obtained with the engine operating on approximately the same fuel-air ratio, that giving maximum power.

The method by which the cards were obtained gives average values of pressures over a number of cycles and

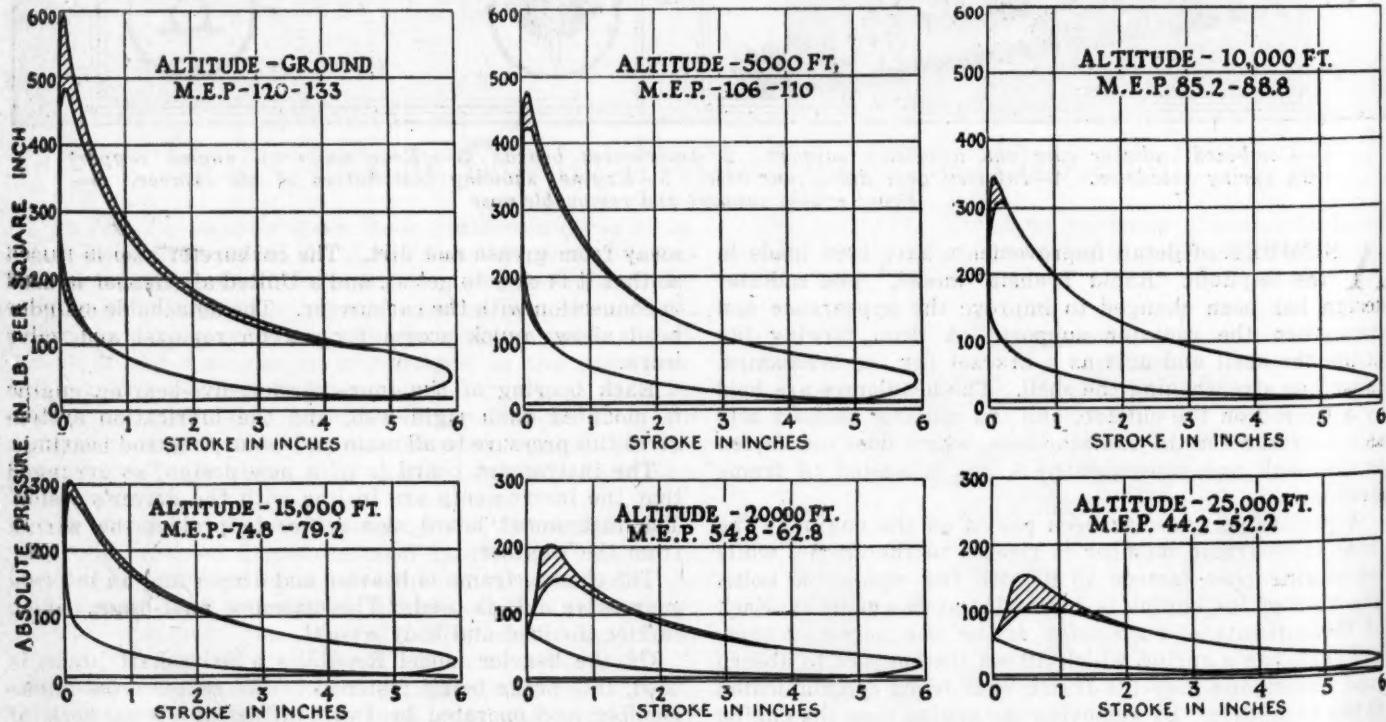


Fig. 2—Indicator cards plotted from results of aircraft engine tests made at a speed of 1800 r.p.m. and at pressures corresponding to various altitudes from ground level to 25,000 ft. Engine had fixed spark advance and fired from two plugs per cylinder

not the record of an individual cycle. Wherever there were persistent variations in pressures both the upper and lower values were plotted. This explains the double lines on the various cards and the two values of mean effective pressure shown for each altitude. In this connection it may be of interest that tests in the altitude laboratory have shown that in general the indicated mean effective pressure of an internal combustion engine varies directly as the pressure of the air at the entrance to the carburetor and inversely as the square root (very nearly) of the absolute temperature.

Ordinarily the pressure in an internal combustion engine varies during the major portion of the compression and expansion strokes approximately as indicated in the following equation: $p_1 = \frac{v_1}{v_2} p_2$ where v_1 and v_2 are cylinder volumes above the piston head and p_1 and p_2 are

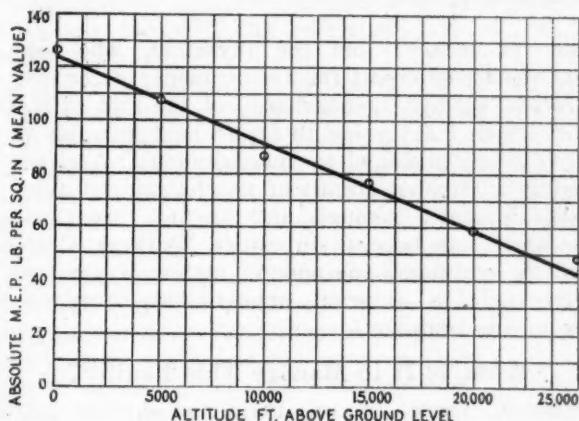


Fig. 1—Curve showing how mean effective pressure of an aircraft engine decreases with the altitude at which it is operated

the corresponding pressures. " n " frequently is termed the exponent of compression or expansion. Values of " n " as determined from the data upon which Fig. 2 is based are given in Table 1.

TABLE 1

Altitude	" (for compression)	" (for expansion)
Sea level	1.38	1.20
5,000 ft.	1.45	1.25
10,000 ft.	1.32	1.20
15,000 ft.	1.31	1.21
20,000 ft.	1.47	1.25
25,000 ft.	1.42	1.19
Average	1.39	1.22

It will be observed that all values are within 6 per cent of the average and that such variation as does occur is not consistent with, and apparently does not depend upon, the altitude. During the major portion of both the compression and expansion strokes the exponent remains at the constant value shown in the above table.

Although the intake valve of this engine does not close until 62 deg. after lower dead center, the value of the exponent " n " during the first 20 or 30 deg. of the compression stroke was found to be slightly higher than that given in the table. This means that the increase in pressure during the first portion of the compression stroke was greater than would have been expected had the intake valve been closed completely at the beginning of this stroke. Presumably this may be attributed to a "ramming" action due to the inertia of the incoming gases although it might be accounted for by a transfer of heat from the piston and cylinder walls to the charge.

As this particular valve timing doubtless has been found by experiment to give high volumetric efficiencies, the existence of a considerable ramming action seems probable.

Volume or Profit—Which Shall It Be?

By A. V. Cummings

IN an industry that talks in terms of billions the pendulum of business methods is at dead center. The force of economic gravity has drawn it to a full stop, yet there still reposes within the industry itself all that tremendous energy and resourcefulness which have set the pendulum swinging upward again through all the crises of the past.

Long discounts and the golden chimera of the trading allowance have never helped its swing toward profits. Association activities which have had the spirit but lacked the principle have moved it not one inch in the right direction.

Despite the thought and energy that have gone into used car panaceas, used car losses still remain a staggering total.

Creation of dealers, more dealers and still more dealers has but slipped the clutch on factory profits.

There is just one force, and one alone, that will swing the pendulum upward on the net profit arc.

And that precisely directed force must curtail factory production until public demand for motor cars exceeds the supply. No dodging the issue, no half-way measure, no side-stepping of responsibili-

ties, will change present conditions for the better. Economic laws that have endured through centuries cannot be brushed aside with impunity by even the greatest industrial structure on earth. A place in the full glare of the sun of prosperity goes only to that industry which places profit before volume. No total eclipse ever threatens the business built upon sound economic foundations.

It was a splendid feat to build and market four million motor vehicles in 1923. But the time has come to change methods. The pendulum must start its swing toward profits, with the full force of the entire industry behind its swing. The time to start it moving is NOW.

No irresolute vacillation should be possible in this huge enterprise. Timidity has no place, nor excuses, when profit pauses and business heart-beats hesitate.

No better business executives anywhere exist than in this great industry, far-seeing men, with fingers pressed to every throb of its titanic pulse.

To them are all eyes turned to start the pendulum toward the profit goal.

We believe they shall not look in vain.

Worker Representation Tends to Change Control of Management

Employees on councils, boards and in administration have proved themselves both as advisory and active members, but where does it lead?

By Henry F. Dennison*
President of the Dennison Manufacturing Co.

THE point of view of J. A. Hobson in his recent book, "The Industrial System," is what I here propose to adopt: "At every point in the elaborate structure of industry each business cell is a complex psychical structure in which the intelligent will of the employer or manager applies stimulus and direction to the wills of workmen and owners of capital, planning their co-operative activity so as to meet the anticipated demands of groups of consumers, which demands themselves are acts of will responding to the pressure of conscious wants."

Notice the hint in this definition that business is not a straight line process. Structurally it has no beginning and end—it is only for convenience in popular description and, moreover, at considerable risk that we say we begin by buying raw material and end by turning out finished goods.

The errors in thinking of the activities of an established concern as occurring in a straight line are serious. The assumption is usually made but rarely expressed for example, that profit is made from the sale of goods, that a transaction ends at a sale.

If we cast out this half unconscious, all pervasive assumption we see business not as a straight line but as a closed circuit. In this deeper insight goods do not go out the shipping room door—they are transformed there into

BUSINESS is not a straight line process. It is a closed circuit. Structurally it has no beginning and no end. It is only for convenience in popular description and at considerable risk that we say we begin by buying raw material and end by turning out finished goods."

a financial force, Credit, which is one of the psychological components of the flow of force around the circuit.

The essential force of industry, in one form or another, flows through the circuit to the suppliers of credit—the Customers. From this deeper insight profit is not made at any one point of the circuit but more or less uniformly throughout much as if it were an inducted current set up by the circuit as a whole.

We have concerned in the closed circuit of a business process three principal groups of human beings: the Customers, who exchange merchandise for money or money for merchandise; the Workers, who exchange ac-

tivities for money; and the Investors, who exchange present money or credit for future money or credit.

Here is a picture—generalized—of the sort of business concern which I am going to try to hold in mind as that which is to be managed by management: A closed and intimately interested circuit of psychological forces, continuous, dynamic, through and among three principal groups of human beings—Investors, Workers, Customers—using as conductors equipments, materials, services, and money which to external appearances constitute the reality of the company.

What Is It to Manage This Reality?

Moreover, there is an insidious double meaning creeping in again and again through the word management referring in one breath to a man or group of men, and in the next breath to an activity or function. For the next step, therefore, I am going to drop the word "management" and ask again: what does managing consist of—what is it to manage.

Managing is not a simple but a compound function. An individual would more or less consciously start his job by picturing the goal or possible goals.

He would lay out before himself the factors of the case, arranging and rearranging such factors with the goal in mind. Then he would devise ways and means.

Let us apply this same analysis to a case of managing when the productive operation is actually under way.

Forces of Management:

- (1) Observing the course of the operation (supervision proper)

UNDERSTANDING

- (2) Selecting the facts significant for record or utilization
- (3) Imagining next job or next step
- (4) Analyzing records and information

DEVISING

- (5) Devising methods, means and incentives (includes designating operatives)
- (6) Establishing understanding of the methods and the goal

PERSUADING

- (7) Giving the operator inspiration (spiritual instruction)

To me this cutting up of management into its component forces, instead of the more usual study of the different projects to which managing applies itself, throws an entirely different light on the whole situation. It shows up, for example, that everybody in the industry does some-

*Excerpts from a paper delivered before the Taylor Society at Cambridge, Mass.

managing—that the elevator man can't decide what floor to stop at if two bells ring without going through the process I have described as managing.

When we provide for putting into actual current practice any part of this managerial process, say, for example, the devising of incentive, we must recognize that this devising is a managerial process every component element of which must be gone through explicitly or implicitly if it is to be fully accomplished.

Take for example establishing an understanding, giving instructions, a part of the managerial process, yet in itself a complete managerial task. The results of previous instruction of employees must be observed, the significant facts selected and put down. In what general direction a better job of instruction might be attained must be visualized, previous experience analyzed with this visualized goal in mind and better, more effective schemes than the old actually devised; and then these new methods must be themselves got across to the people who are to instruct the employees.

If the claim be brought forth that this method of analysis is too complex, I shall insist that the industrial situation, and each member of the industrial concern is in himself complex, and that what we have suffered from so far has been oversimplification, not complex analyses.

How much that goes by the name of Management fails to give any adequate study of the available, applicable facts? How far has management attempted to picture the goals it meant to reach? And how far has it failed utterly in getting across to its executives or its employees a real understanding.

It is a great deal more than a useful check list that I am placing before you. I mean it to supplement the too habitual concentration of attention on the tools through which we manage rather than the function itself. Systems, machines, rules, authority, incentive plans, are devices through which the managing function can accomplish its ends. The best of all these devices—the finest machines to the most perfect profit sharing plan—are fully capable of lying idle; mismanaged they are capable of doing harm.

Rigidity to Be Avoided

Merely having a management, moreover, a head office with general manager or a crew of officials, is in itself of no importance unless they go through a complete managing process of understanding, ingenious devising and effective persuasion.

Laws and rules are devices-tools which can be effectively or ineffectively constructed and construed. Attempting to manage without rules is doing by hand what might be better done by machine; attempting to manage entirely through rules—to let rules manage for you—is to overmechanize and so to suffer from rigidity and oppressive fixed psychological charges.

Isn't it easy to fool ourselves pretty deeply on that word "policies?" In what, except perhaps in "loftiness," does policy differ from any managerial determination promulgated to the next lower group of executives or at last to the individual operative?

Unconsciously, I am afraid we tend to call it "administration" if the treasurer and the stockholders and the financial interests generally are a part, management if they are not.

Analysis of the dynamics of managing seems to offer no grounds for a fundamental distinction between administration and management. Mr. Rich's definition that administration has to do with policies fixed over a considerable period while management is concerned with the problems of week to week, turns out to be a relative

differentiation rather than a fundamental distinction.

If managing, then, is a compound process made up of observation, planning, and instruction, who is to do the managing? Let me repeat in answer, that everybody's got to do some of it, even to the man working under the most minute instruction card.

Incidentally it appears that the present intense interest in management sharing through works councils, or other collective devices, is a more or less unconscious attempt to devise a method of getting the advantage of much more of the total managing abilities in the group, especially those related to observation and instruction than the old one-man or autocratic structure could get.

We human beings don't fit ourselves into place in any organized structure as do molecules during the

"**G**OODES do not go out the shipping room door. They are transformed there into a financial force, credit, which is one of the psychological components of the flow of force around the business circuit."

process of crystallization, but we must be placed and our jobs designated.

Having hired the lowest group, the operatives, how can we choose from among them or elsewhere the group of people, such for example, as junior foremen, whose proportion of managerial work is so large as to be of primary importance?

There has been a certain blundering naturalness to the old method of picking entries into the managerial class, part by inheritance, part by ability, part by good appearance. Psychology helps, but we must use the same conservative care in putting its suggestions into practice as we would in the bulk manufacture of a new explosive.

Clearly all the knowledge possible of the candidates is desirable, so, too, is a very real knowledge of the managerial tasks that it is proposed to put upon them.

It is natural, therefore, that the choosing or designation should be done for the most part by the managerial unit which is planning the task and providing for its operation. I think a very great majority of practical business men would say without hesitation that wisely to choose foremen or assistant superintendents one should be in daily direct contact with the situation. But if each managerial unit should choose the instruments whom he must instruct and inspire to carry out his actual purposes, who is to choose the last chooser?

Of course there is a sense in which it can be said that there is no absolutely final power in any industrial operating group. Circumstances, the market demands of customers, the law, all have their say heavily to condition the decisions of any vote of directors or sole owner. Yet within the group itself there is a last chooser of methods and men. In our typical industrial concern this will, of course, be the board of directors.

Certain notions almost habitual with us must here be set aside or in any case very critically examined if they are to be allowed to apply. Such are the notions that gather about ownership—the age-long feeling that one has a right to do as he pleases with his own—a right which has never existed in untrammeled fashion and is subject to more and more limitation as society becomes closer knit and more complex, likewise the notions that gather about the taking of a risk.

But who is best fitted to choose the ultimate chooser, who is best fitted to choose the board of directors, who, in other words, can best hire management?

Let us examine some characteristics of the three principal groups in the industrial concern—the Investors, the Workers, and the Customers. Think of each of the groups as possible choosers of the board of directors. Just now it is the Investors.

The call for investment to develop the civilization of the world made capital the one commodity for which one must sell his soul if need be. Results as a whole are obviously workable, with evils arising out of non-residence, relative ignorance of the concern's operations, a lack of any great possibility of continuous contribution to the progress of the concern, and the lack of possible continuous incentive; and the rather negative incentive toward careful management, which arises out of the risk factor and works through fear.

The Special Interest of Investors

Investors have their special interest as each of the groups has and in their case by virtue of it tend to pay as low wages to workers and low prices to suppliers as possible and make prices to consumers as large as possible, so that the margin may be maximum.

While it seems very unlikely that any other form of control would have done better, there are many sad cases of inherited control, there are still straw boards of directors like that which led the New Haven road, over fifteen years ago, on so silly a course; there is a serious lack of appreciation of customers' or workers' real interests, there is far too much tendency to count the dollar as the only score in the game, far too little knowledge and interest in operation, and too much in stock marketing.

Yet if we turn to the possibility of control by customers we find in the generalized case just about the same group of handicaps.

Their special interest would lead them, as it has led Investors, to deal as closely with the other two groups as circumstances would allow; to pay both the workers and the investors the least that would gain such services from them as are needed. It is true prices would tend to be lower; and now a few folk have been led by the lure of oversimplification to paint a complete Utopia built upon low prices.

When we turn to control by the working force in a modern concern (and please remember that by working force I mean all who work whether their primary work is managing or manual labor) we face a somewhat different picture.

They are in residence, they have within the total of their group about as much inside knowledge as exists; they have every imaginable possibility of constructive contribution and as wide a range of special incentives can be invented to secure it. Their risk is moderate, they have a certain vested interest in their jobs—not so great as to cause the extreme of nervous fear we find among investors, nor so little as to fail as a motivating force.

Their special interest would be to pay investors as little as possible and make prices as high as possible yet held a bit in check by the opportunity to gain an understanding of the other two groups, more complete and deeper than Investors or Customers could gain of their two partners.

Some years ago it would have been considered entirely fanciful to be speculating about the sober, businesslike possibility of some day finding the working force in the same relation to the concern that the Investors have so long held. Not only have we a few special cases of experiment in individual concerns, but great social groups in Russia, Italy, England, and Germany have been performing before our eyes.

There is no reason to believe that Workers' control might not follow closely the example that has been set it by Investors' control and hire a management which shall attempt not to effect a dynamic coordination—a cooperation among the three groups in industry—but attempt to cramp the other two as much as it can get away with and skim off all that it possibly could for itself.

On the other hand, there is among the working force the opportunity for more sensitive appreciation and understanding of the nature and interests of the other two groups.

If we focus attention upon those individuals whose work involves the understanding of the widest range of facts about the concern, whose possibilities of contribution are greatest, there comes into mind, I think, a picture of a sub-group of workers which, using the words in a very broad way, we might call the "managerial force," whose selfish interests, whose particular characteristics and qualifications all combine to make them the most hopeful instrument through which the chief management of a concern is chosen.

The principal managerial job in any concern is the coordination, the composition, the integration of impulses, energies, and interests of the three principal groups of human beings—the Investors, the Customers, the Workers. The special interest of each group is a serious disqualifying factor. Among the working force taken as a whole there are characteristics which tend somewhat to diminish the disqualification.

If there could be added to them by some scheme of proprietorship a share of the Investors' interest, and by education or by some as yet uninvented scheme of more organic nature, a share of the Consumers' interest as well, a very great advance in social fitness for the hiring of management would have been accomplished.

Until that time the best approximation possible can be made by selecting out as wisely as may be the special sub-group of the working force in whose work the managerial element is of predominant magnitude, and placing among them the opportunity and responsibility for the election of the final governing body.

Only Management Can Hire Management

In a word, I believe, then, that only management can hire management. It is not merely that abstract reasoning points that way: experience hints strongly that efforts to get out from under the artificial system of investors' control will be persistent and ingenious.

Because of our ingrained custom of measuring success by the money that is *made*, as we say, some such are commonly thought of as successful merely because they have been able to pay dividends, though as an operating organization they may reek to heaven. For success in productive effort we all hanker after the old style of firm whose members had their time and their money tied up in its fate. And investors and other representatives of the financial men, when trouble is in sight, seek for him who can get into the game all over, who will both manage and control, who will be Management hired by Management. And the future, as well as past experience holds hints of its own. Is not investor control not now becoming too awkward to hold its own in the hard fight of the next years? And, too, as the world's open spaces close up—forcing upon us not only stiffer competition but a firmer credit structure and easier capital—will not managerial ability of high enough order to win be the scarce commodity rather than capital and so win the control it can claim not only as its scarcity price but as its appropriate social engineering functions as well?

Horsepower Output Determined by Measuring Rate of Air Consumption

Tests of aircraft and automobile engines both on the bench and in flight show that with given air-fuel proportions the brake hp. will be indicated by the amount of air used.

IT has been found that the brake horsepower delivered by an internal combustion engine under full throttle conditions, if the proportion of the fuel mixture is within reasonable limits, is very closely proportional to the amount of air consumed, and that it is therefore possible to determine the horsepower output of aircraft and automobile engines by measuring the rate of air consumption. A paper on the subject was presented at a recent meeting of the Institution of Mechanical Engineers in London by Dr. H. Moss of the Air Ministry Laboratory. Experiments made at the laboratory showed that if the air-fuel proportion is held between the limits of 11 and 14, both the indicated and the brake horsepower are closely proportional to the air consumption.

The method of measuring the air consumption adopted by Dr. Moss was originated by Prof. H. L. Callendar and has been used by several others. It consists simply of measuring the amount of electrical energy which is required to heat a stream of fluid through a given interval of temperature.

Theory Not Difficult to Follow

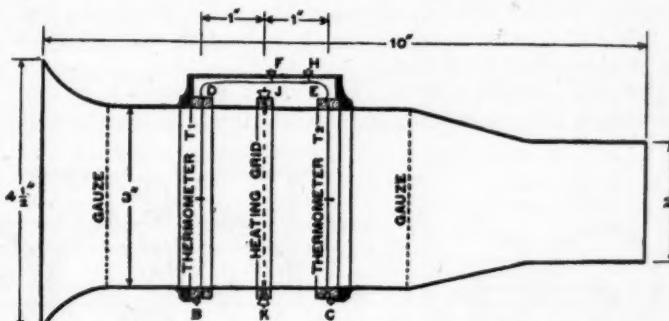
The theory of the method is not difficult to follow. If a resistance of R ohms with a potential difference of V volts across its terminals be inserted in a steady current of air flowing at the rate of W grams per second, the energy developed at heat in the resistance will be V^2/R joules per second, and the energy added to the air will be $JSWt$ in joules per second where J is the mechanical equivalent of heat, S the specific heat of the air, and t the range through which its temperature is raised by the heat received from the resistance. These two quantities being equal, we have $W = V^2/R SJt$. If S be taken as the specific heat at constant pressure and as being substantially constant at all temperatures and pressures likely to be met with, JS becomes a constant, and on the metric system is numerically equal to 4.18×0.24 , or very approximately unity. The equation thus simplifies to $W = V^2/R t$. If the material of the resistance has no temperature coefficient R is constant, and if t , the temperature rise, is chosen at some given value, say 1.5 deg. Cent., then the equation becomes $W \propto V^2$; that is to say, the air flow is proportional to the square of the voltage which must be applied to the resistance to raise the flow 1.5 deg. Cent. in temperature.

The instrument used by Dr. Moss is indicated in the accompanying engraving. On each side of a heating grid JK is a resistance thermometer BD, CE . By means of a connecting wire the two thermometers are used as two arms, FDB and FEC , of a Wheatstone bridge, the point F being found experimentally and being such that with no current in the heating grid there is no deflection of the galvanometer needle. In this condition there is a small heating effect derived from the current flowing in the thermometers, and this fact prevents the point F being fixed otherwise than experimentally. In use the terminal

F is discarded in favor of the terminal H , the resistance FH being chosen such that no deflection of the needle will occur when the second thermometer is 1.5 deg. Cent. higher in temperature than the first. The measurement of the voltage applied to the heating grid to produce such zero deflection is effected by means which are designed to eliminate the effects of vibration and of temperature changes in the parts of the measuring device.

The flow meter, as the measuring device is appropriately called, was calibrated in a steady stream of air, the flow of which was independently measured by means of an air box provided with a circular sharp edged orifice. It was found that the two measurements agreed to within one part in 200. The air box and flow meter were then transferred to the inside of a Ford truck in order to examine whether the meter behaved equally well when the air flow was not steady but was the actual flow to an engine. It was found that the air box and flow meter readings differed by some 5 per cent. This discrepancy arose from the formation of vibrations in the air in the connecting tubes, and could be eliminated by damping out these vibrations by inserting a small silencer between the flow meter and the engine.

The flow meter was next applied to a single-cylinder 40 hp. Benz aircraft engine. With an air tank of $1\frac{1}{2}$ cu. ft. capacity between the meter and the carburetor it was found that errors arising from the variable velocity of the air flow were eliminated, and that the meter gave the correct mean value of the flow. A larger size of flow



Air flow meter based on the electric heating principle

meter was then constructed and applied to a six-cylinder Siddeley "Puma" engine—nominal output 240 b.h.p. at 1400 r.p.m. The flow meter was calibrated as before in a steady stream against an air box and was subsequently applied to the "Puma" engine run on the bench. In the latter test the readings were checked against simultaneous air-box readings, and it was found that the steady stream calibration applied to the engine trials with an error which did not exceed 1 per cent. On the bench test it was found that at full or slight throttle the brake horsepower lay between 1.08 and 1.07 per gram of air per second.

When the engine was severely throttled down, however, the value fell to 1.04.

In some preliminary flight tests it was found that the conditions for the operation of the device were considerably steadier than on the Ford truck, and that the presence of the flow meter reduced the engine speed by only 10 r.p.m. and the air speed by but 1 per cent.

From a variety of tests made during flight at various altitudes up to 14,000 ft., it was deduced that the indicated horsepower of an aircraft engine is very nearly proportional to the density of the air at the flying level and that the air consumption, as measured by the flow meter,

should give the brake horsepower with a possible error of less than 2 per cent. It is particularly noted that when an aircraft engine is throttled down to half power on the ground the conditions are not quite the same as those experienced when the power falls to one-half as a result of altitude conditions.

Methods for measuring rates of air flow are the electrical method, as described in the paper; the orifice method, as used at the Bureau of Standards and several private laboratories in this country, and the Venturi tube method. One advantage of the electrical method was said to be that it gives the weight of the air passed.

How Highway Irregularities Are Measured

APPARATUS for quickly and conveniently measuring the irregularities in the surface of highways recently has been developed by the State of Illinois, Division of Highways. This apparatus is mounted upon a light, 16-wheel chassis, designed especially for the purpose, and is illustrated in Fig. 1.

Each of the wheels can be steered about a vertical pivot from a common steering wheel through the medium of the cable and connecting links shown in the cut. The platform upon which the recording apparatus is carried is so mounted as to be practically unaffected by the wheels passing over irregularities of the road.

This is accomplished by use of the system of parallel links or bolsters upon which the platform rests. Raising any one wheel one inch, it is asserted, would raise the recording instrument only 1/16 in., even if there were no springs. This is because of the equalizing link arrangement. The springs are said to prevent even such slight deflections of the instrument.

Records are made on a chart which is reeled off of drums driven by belt from a wheel in contact with the road surface. The motion of the paper is proportional the distance traveled by the road contact wheel, which can be raised and lowered at will, thus stopping and starting the record when desired. The pen which makes the records of irregularities is attached to one end of a pivoted link the other end of which is attached to a rod. The lower end of this rod carries a wheel which is held in contact with the road surface by a spring.

The rod carries also a rack which engages a pinion carrying a ratchet mechanism which gives a summation of

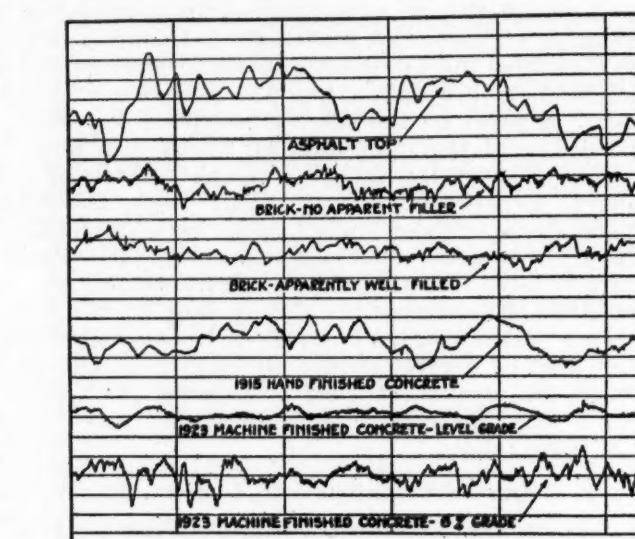


Fig. 2—Diagram obtained by use of the profilometer

the up-and-down travel of the rod. This furnishes a useful index of the "riding qualities" of the pavement. Thus an excellent pavement shows a total roughness of 0.66 in. per 100 ft., a good pavement 3.78 in. per 100 ft. and a rough pavement 9.46 in. per 100 ft., according to tests made by the use of the profilometer. A reproduction of the graphical record made by the instrument on various surfaces is reproduced in Fig. 2.

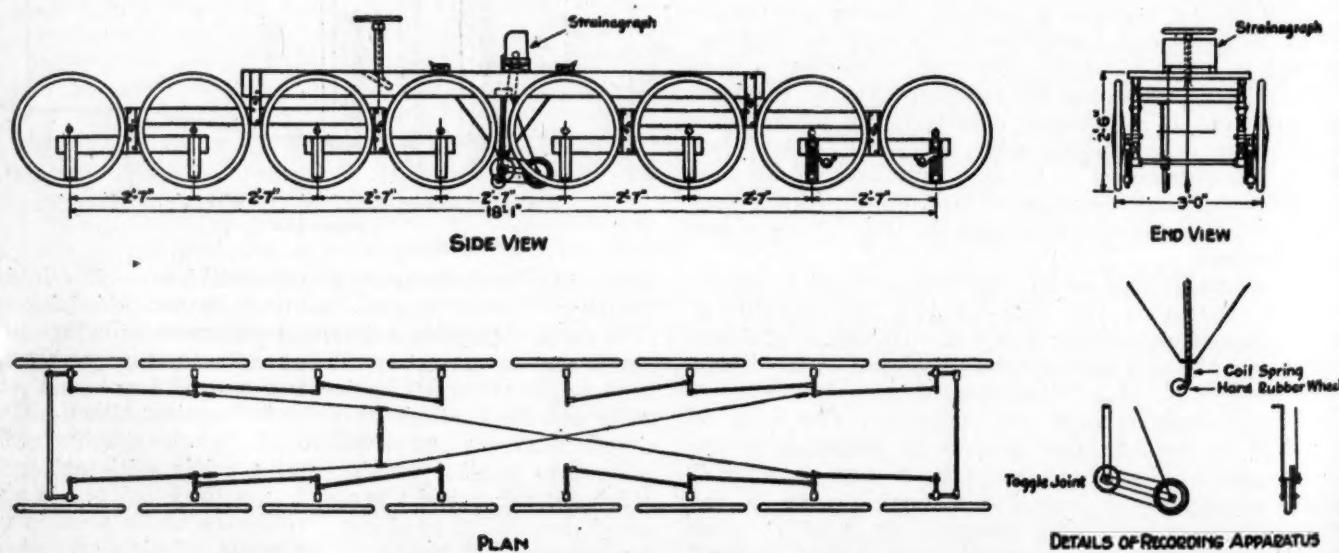


Fig. 1—Profilometer used to measure road irregularities

Here and There in Foreign Markets

By special arrangement with the Automotive Division, Bureau of Foreign and Domestic Commerce

Scandinavian Countries Market Improved

DESPITE the increased customs duties imposed by Norway and Denmark, the import of passenger automobiles into Scandinavian countries during the early months of 1924 considerably increased over the corresponding period of 1923. "The rise in automobile imports was especially marked in Sweden," the advices continue, "a reflection undoubtedly of the improvement in the general economic situation, passenger car imports during February and March, 1924, amounting to 740 and 782 respectively, as against 375 in January, 1923, and 444 in February."

Norwegian imports also increased, rising from 248 in January and February, 1923, to 301 in the first two months of the present year. During the same period Danish imports of passenger automobiles declined from 270 to 212. Following the depreciation in the foreign exchange value of the crown, the Danish Government, in an effort to curtail imports, adopted various restrictive measures. Customs were raised, and in January of the present year a special tax, ranging from 15 to 30 per cent, was placed on the sale of automobiles. The effect of these measures is evidenced by the fact that automobile imports declined from 146 in January to 66 in February.

Buses Increase in Athens

TRADE COMMISSIONER Charles E. Dicker-
son, Jr., at Athens, Greece, advises that although motorbus traffic is rapidly becoming important in Athens and its suburbs, the number now in operation being placed at about 200, comparatively few cars have been specially imported for this purpose.

"Owing to the present activity in bus operation," the dispatch continues, "there exists a good opportunity for the importation of foreign machines into Greece, and leading dealers are reported to be seeking representation. The great majority of buses now in use have been supplied by adapting locally-constructed bodies of the chassis of old army trucks, and one local firm is doing a prosperous business in remodeling machines."

Extending Bus and Taxi Service

BUSES are being used extensively in Melbourne, Australia, as feeders to the tramways during the electrification of a number of cable tram lines. Their use will probably lead to the extension of bus services along roads where the traffic density does not permit of tramways or the use of trackless trolley buses. The city

of Sydney is also expanding its motorbus services, one company having just recently completed 20 new cars, each accommodating 40 passengers. In Melbourne a taxicab company has begun operations with 100 cars, Trade Commissioner E. G. Pauly, Melbourne, reports.

Palestine in Market Since the War

INCREASE in motor car traffic in Palestine and the necessity for improved roads have led to a decision to raise the fees for car licenses. American Trade Commissioner Richard A. May at Alexandria, Egypt, cables. He advises that the fees will be based on the seating capacity of motor cars and the haulage capacities of trucks and tractors. About 600 private and commercial cars are now in operation in Palestine, practically all of them having been added since the war, the cable concludes.

Fire-Fighting Apparatus Survey Available

RESULTS of a world-wide survey of "Fire-Fighting Apparatus and Equipment" are now available to the American automotive industry.

This survey, which covers leading countries of the world, embodies the answers to a questionnaire sent by the Automotive Division to all consular and commercial offices of the United States Government. It affords an opportunity to visualize the potentialities of many markets and shows American manufacturers both the opportunities and difficulties in placing American fire-fighting apparatus in foreign countries.

Because of the limited number of manufacturers of this type of equipment in the United States, the survey will not be issued in printed form. A loan copy of the typewritten manuscript is available to inquirers upon application to the Automotive Division, Department of Commerce, through the proper district or cooperative office.

Automotive Press Digest

THE city of Corunna, Spain, proposes buying the following fire-fighting equipment soon after June 1: Fire-fighting motor car, the motor also to be available for pumping if necessary; pump with spray; spool of 300 meters of hose; chemical fire extinguisher; three ladders and hooks; one expanding ladder with attachments; two gas masks; harpoons, axes, hooks, and seven or eight fire alarms; two-horse hose wagon. American manufacturers might find it advisable to file literature, prices and terms with the American Consulate at Corunna.

Finishing and Refinishing Approaching High Engineering Standard

Painting problems now being solved on truly technical basis, says L. V. Pulsifer. No excuse today for not knowing how long coatings will last. Pyroxylin roughstuff now available for use with Duco, but linseed oil surfacers still are used widely.

By Herbert Chase

HIGHLY durable finishing materials which now are coming rapidly to the forefront in automotive circles are of almost as much interest to the refinisher as to the car manufacturer and, since the former is called upon to give service which has a marked effect upon the latter's business, there is much to be learned from a study of modern refinishing methods such as those which were discussed at the latest meeting of the Metropolitan Section of the Society of Automotive Engineers.

Among the important points brought out at this meeting was one made by L. V. Pulsifer of Valentine & Co., who said that finishing as well as refinishing is being brought rapidly to an engineering basis and that, with our present knowledge of finishing materials, the life, at least of varnish finishes, can be predicted with considerable accuracy, so that there is no excuse except ignorance for unexpected or premature failure of such a finish.

O. H. Briggs of the E. I. duPont de Nemours & Co. made it clear that Duco pyroxylin finishes now are being used extensively and successfully by the refinishing trade as well as in the finishing of new cars. The manufacturers of Duco have developed suitable pyroxylin undercoats so that base coats of the ordinary type can be dispensed with if desired, although Duco still is used with satisfaction over linseed oil undercoats when for any reason they are preferred.

In the discussion of the two papers presented respectively by Messrs. Pulsifer and Briggs it was brought out that the class of refinishing job which is expedient depends largely upon the judgment of the refinisher. The

life of a refinished job which is done without removing all old paint is dependent not only upon the condition of the old finish but upon its original character. While the only way of being certain of a durable refinish job is to remove all old paint, thoroughly satisfactory refinishing over old coats frequently can be applied providing deterioration of these coats has not proceeded so far as to make their removal imperative.

In this connection it was stated that every effort should be made to educate automobile users to have refinishing done before the finish is so far gone as to make it impossible to restore it satisfactorily.

How Varnish and Pyroxylin Differ

Dr. A. H. Sabin of the National Lead Co., who presided at the meeting, called attention to the fact that cellulose nitrate finishes differ materially from those using linseed or other similar oils, in that drying of the pyroxylin film is accomplished solely by evaporation of the solvents employed, whereas drying of oils involves a chemical change or oxidation of the surface which does not take place with cellulose nitrate materials. Dr. Sabin said that about \$458,000,000 is spent annually in the United States for paint and varnish and that it is estimated that the cost of these finishing materials averages approximately 1 per cent of that of the articles to which the paint and varnish is applied.

In the discussion of the paper it was stated that when Duco finish is to be applied over wood it is desirable first to apply a coat of clear Viscolac, which tends to prevent deterioration of the finish through expansion and contraction of the wood. An attempt is being made to develop accelerated aging tests which will give an indication of the life of pyroxylin finishes. In these tests the fadometer and ultra-violet light are being employed, but it has not yet been determined just what is the relation between natural aging and artificial aging.

A dealer in Duco for refinishing purposes stated that one of the advantages of this class of material is the fact that it can be applied by relatively unskilled labor after two or three weeks' training, whereas it is very difficult to secure experienced refinishers who are qualified to handle varnish finishes satisfactorily at times when paint shops are operating at or near full capacity.

Asked whether workmen who apply cellulose nitrate finishes suffer from impairment of health, Mr. Briggs replied that providing proper exhaust fan equipment is installed there is no great difference in this regard over ordinary finishes.

Mr. Briggs said in reply to another question that it is

AN important element in service work which heretofore has been neglected is that involved in refinishing cars which have become unsightly through use or abuse. Too often the service station has turned over work of this kind to shops which employ only old-fashioned and unnecessarily expensive methods.

Refinishing as well as original finishing methods and materials have been improved greatly within the past few months. Some such systems are outlined in this report. It will pay car manufacturers to study them and see that their service organizations are properly informed regarding them.

difficult to compare the cost of Duco with other finishes without knowing all factors involved. It is not contended, however, that Duco is as cheap as are baked enamel finishes when production conditions warrant installation of baking ovens for enamel.

Conditions for Application of Duco

In reply to other questions Mr. Briggs stated that Duco withstands the action of salt water. It is not recommended that Duco be applied directly over a smooth metal surface. A suitable primer should be employed or the surface rendered slightly rough by sand blasting or other means. There is no gain in drying Duco finishes at temperatures above 125 deg. Fahr., although they will withstand higher temperatures successfully. Duco is not suited for application by brush, on account of its rapid drying qualities, but experiments with similar material which can be applied with a brush are in progress.

In answer to various questions Mr. Pulsifer said that he regards the action of the chemical rays of sunlight in localities such as southern California as being more destructive than that of alkali dust, although the latter is injurious. He said that test panels exposed to sunlight at an angle of 45 deg. facing south show a much more rapid deterioration than panels placed in a vertical position. This is due to the greater intensity of the light and accounts for the more rapid failure of the finish on hoods and rear decks of cars than of that on the sides of the body.

Asked whether it is permissible to combine a color with a sealer, Mr. Pulsifer replied that this practice is not recommended.

Mr. Pulsifer attributes the prominence which the general subject of finishing is receiving at present to three main causes: First, the practical elimination of many common troubles with the mechanism of cars has caused the owner to pay more attention to appearance than formerly; second, development and advertising of more durable finishes; third, national advertising campaigns under such slogans as "Save the Surface" and "Clean Up and Paint Up."

Character and Condition of Old Finish Important

Continuing, Mr. Pulsifer said that the character of the original finish as well as its condition at the time refinishing is undertaken has an important bearing upon the proper class of refinishing demanded. As an illustration of this fact, the result of refinishing two cars with a highly elastic finishing varnish was cited. The first, a low priced sedan which was purchased in the spring and which received originally the following coats—primer, spot putty, ground color, color varnish and finishing varnish, the last coat having about 30 points elasticity—was refinished after six months' use and stood up for another year. The second car, bought at the same time, used six months and revarnished with the same material, went to pieces the following winter.

This was a high priced town car and had received 12 or 14 coats of material, the last four of which consisted of three coats of color varnish all of the same elasticity, and a final coat of finishing varnish of about 60 points elasticity factor. The final coat was applied over comparatively brittle undercoats, had reached the end of its rope in about six months, and had failed soon after refinishing solely because of the failure of the thick film underneath the varnish used in refinishing. In this case the color varnishes were blue and had been made more brittle by the chemical action of the blue pigment.

This experience is similar, in general, to that which results from the use of a number of relatively inelastic undercoats or of coats in which the elasticity is not con-

tinued in such a way that it is high for the primer, decreases gradually to the body color and thereafter increases gradually and in regular steps to the final coats, which should be highly elastic.

He illustrated the point by elasticity charts similar to those used in other papers which he has presented before the society and to those reproduced in these columns in connection with the description of the latest Valentine varnish system which appeared in *AUTOMOTIVE INDUSTRIES*, issue of May 1, 1924. A considerable part of the Pulsifer paper was devoted to a similar description of this system.

In discussing refinishing Mr. Pulsifer spoke in part and in substance as follows:

There are four classes of refinishing jobs: First, that in which all old paint is removed and the car repainted as in new work; second, one consisting of a surfacing down, resurfacing, recoloring, color varnishing and finish varnishing; third, rub down, recolor and varnish; and fourth, rub down and revarnish with finishing varnish only.

In Class 1 work, the finish is best removed by hot caustic solutions, but paint removers of other kinds can be employed if care is used to remove all wax left by a thorough washing with a mixture of alcohol and benzol. A Class 1 finish is the only one which will be wholly satisfactory if the old finish is cracked and especially if wax, polish or renovators have been used on the car.

Refinishing Over Old Surfaces

Refinishing in the second class can be done over old surfaces in which cracks are not too deep and on which habitual renovating, polishing or "dry washing" has not been done. The surface should be cleaned carefully, using gasoline if necessary, followed by a water wash, sanding smooth, application of a coat of metal primer, a brush coat of sanding surfacer, putty up, sanding smooth, coat of ground work or japan color made elastic by admixture of 25 per cent of clear primer with turpentine used for thinning, followed by color varnish and finishing coats as on new work. Use of the metal primer as a first coat in this class of work is highly desirable, as it serves to knit the new coats to the old and bridges over any cracks left in the surface.

The third class of refinishing is applicable where the old finish is intact and has neither checked nor cracked. The procedure is to rub down with pumice stone flour and water or water sand after thorough cleaning. Then apply one or two coats of color varnish, rub and finish. If it is de-

sired to change the color of work in this class it is necessary to use flat color, the clear primer mixed in first coat of color, and color varnish.

If Class 4 finishing is used when the old finish is in good condition, without cracks and neither discolored or faded, it is necessary only to clean and wash the job carefully, rub to a dull surface with pumicestone flour and water and refinish.

Refinishing of fenders, hoods and bodies originally finished with black baking enamels calls for special attention. Owing to the extremely impervious surface presented by these enamels and to their frequent greasy or oily nature,

REFINISHING is one branch of service work which has been too much neglected by most service stations. Heretofore a first class refinishing job required four to six weeks and cost accordingly. Today, a well-equipped shop can take off all old paint and refinish a car in one week or less, while three or four days is enough to recolor and refinish a car on which the undercoats are still in good condition.

These are pertinent facts for the owner as well as for the service establishment. They mean that service operations which heretofore have been turned over to specialists now can be done with profit by many service stations.

it is necessary to surface them down carefully, wash them with benzol or alcohol and then apply a coat of black finishing varnish. For a quick job this is all that is needed, but for best results apply on the first day a coat of black metal primer, on the second day moss off lightly with curled hair and apply a coat of black finishing varnish, and on the fourth day rub lightly with pumicestone flour and water, wash clean and apply a full flowing coat of clear finishing varnish.

When there is a demand for a low price, high speed, high gloss, durable repaint job frequently calling for a new color, it can be met by using the best type of spar varnish enamel, which dries quickly and gives a solid and brilliant color of great durability. Use of this type of enamel permits the service station or repair shop to do high speed work at minimum price where the ultimate in depth and smoothness of finish is not required. The usual cleaning methods should be applied together with resurfacing if this is necessary. The enamel takes the place of the usual color, color varnish and finishing varnish coats. A ground color is necessary only when painting very light colors over very dark ones. When two coats are used the customer has the advantage of two coats of a finishing material which at present are coming into favor, as well as the other advantage of the highest grade spar varnish.

Speaking in reference to Duco, Mr. Briggs said: "Through research we are now endeavoring to perfect our formulas beyond the present stage, our chief aims being to simplify the pigment content, increase covering property and lengthen life.

"Final breakdown of Duco film is an erosive action, porosity of film on wear finally admitting small particles of water.

"Recent investigations in the paint field have clearly

shown that the type of undercoats under finishing varnish greatly influences the life of the finish considered as a whole. Mr. Pulsifer's presentation of this point of view is a clear exposition of general deductions that can be drawn from the facts as they are known at present.

"It is somewhat difficult in the present stage of the art to state definitely that these principles must be applied in the use of pyroxylin enamels, but I believe it is safe to say that pyroxylin enamels and their application do not require much emphasis on the relative elasticities of succeeding coats. The pyroxylin material can be considered more in the light of a homogeneous material which, in the finished film state, is of the same composition throughout. This is particularly true if the finish is brought up from the metal with pyroxylin under-surfacer, followed by colored enamel coats.

"In this connection, however, it is well to point out the importance of thorough drying between coats, else the effect mentioned by Mr. Pulsifer of a coating of lesser elasticity will be obtained, although in a condition less marked than is sometimes obtained in paint or varnish. This can, and has in test panels, resulted in breakdown of the ultimate finish."

A summary of the important parts of Mr. Briggs' paper which have not been covered heretofore in these columns follows:

In refinishing, removal of all paint is best accomplished by use of a chemical remover such as that employed in the Aloca system, in which a caustic solution with hot water is employed. Other paint removers can be used, but care must be exercised in removing the materials themselves after they have been employed. Under favorable conditions the Aloca system will remove the old paint from a medium size phaeton body in a minimum of about two hours. Care must be exercised to remove all traces of the caustic solution. This can be accomplished by washing the parts with duPont thinner and gasoline and sanding the entire body.

Surfacing prior to application of Duco can be accomplished either by using ordinary surfacing materials or by the use of pyroxylin. If the regular paint type surfacers are used each coat must be oxidized thoroughly to produce best results. If not, the coating is softened by the solvents used in Duco, which dissolves unoxidized linseed oil.

The first step in surfacing a car with pyroxylin materials is the application of a light spray coat consisting of about four parts of pyroxylin roughstuff to one part thinner, the latter being the solvent mixture used to reduce Duco to spraying viscosity. This proportion is used with overhead or gravity feed type guns. When a cup type gun is used equal parts of thinner and roughstuff are employed. This coat should dry for one hour.

Preparation of Undercoats for Duco

Next spot spray, using a small type cup gun with material mixed in the proportion of six parts roughstuff to four parts thinner. In applying this coat the gun should be held about twelve inches from the surface and enough material applied to the file marks and other body defects to insure filling them completely. Follow this spot spraying immediately with a heavy spray coat containing four parts pyroxylin roughstuff to one part of thinner.

This coat should be allowed to air dry for three or four hours. Next rub this surface with dry No. 240 sandpaper just enough to remove small particles of foreign matter collected while drying. The second surfacing coat is then applied the same as the first and allowed to dry over night. This coat then is rubbed to a surface, using No. 220 and No. 240 sandpaper and water or gasoline. This rub can also be made with an equivalent grade of

emery paper. There seems to be some benefit from the use of gasoline in obtaining a smoother surface.

The first coat of Duco should be applied lightly. If the overhead feed type gun is used, the proportion should be three parts of Duco to one part of thinner, and if the cup type gun is used equal parts of thinner and Duco should be used. This coat should be allowed to dry for one hour and then given a very light rub with dry No. 240 Manning speed grits or its equivalent.

This rub is merely to remove the high spots and dirt spots. If after this light rub has been given there are incompletely filled spots or file marks still showing, it is well to spot spray with a small gun, using the first coat Duco material. Follow this with a heavy spray coat of Duco thinned in the same proportion as for the first. This coat should be allowed to dry over night and then rubbed to a surface, using No. 240 and No. 280 Wetordry sandpaper.

After the surface has been obtained, apply a light top spray coat of equal parts No. 1697 gloss and Duco thinned with an equal amount of thinner.

High Luster Decreases Durability

If a higher luster than that obtained with straight Duco finish is desired, some sacrifice of wearing qualities must be made, since the satin finish represents the maximum of durability. In the gloss finish this is true in the case of the opaque colors, but is particularly true with reference to the transparent and semi-transparent colors such as maroons. In case it is necessary to obtain an even higher luster in finishing, this top gloss coat can be allowed to dry two hours and then be given a thorough rubbing with Simoniz cleaner, which will bring up a very satisfactory high luster, followed by a washing with Simoniz wax.

When working with bodies having exceptionally deep and numerous file marks, it sometimes is found advisable to use a knifed-in putty glaze. When this material is used it is knifed in over the first priming coat of pyroxylin roughstuff and subsequently carefully and thoroughly

rubbed out with the second coat of pyroxylin roughstuff.

In touching up underneath the fenders it is good practice to apply a spray coat of shellac to the metal, allowing it to dry prior to the application of the spray coat of Duco.

Applying Pyroxylin Finish Over Wood

For finishing wheels very satisfactory results can be obtained by rubbing down the old surface to satisfactory smoothness and then applying a thin spray coat of Duco, following it with a heavy spray coat and finishing as outlined above. When the paint is removed from the wheels and wooden parts it is advisable to spray on a six to four mixture of No. 1610 Viscolac intermediate and thinner. This material has better adhesion on wood than Duco and prevents the absorption of moisture into the wood during the rubbing operation. It also tends to give a very satisfactory build for the later application of Duco.

This procedure can be followed on wooden upper structures as well as for wheels and other wooden parts. When the paint is badly checked and crazed to the wood, it is advisable to apply a coat of sanding surfacer. Rub out and then apply a light coat of Duco, followed by a heavy coat and a light top gloss coat to bring up the luster to the same point as on the body.

In touching up "off color" spots, apply a fifty-fifty Duco and thinner mixture with a small artist gun.

To cut in two-color jobs, it is advisable to spray the lower structure first and then the upper. A cardboard or heavy paper can be used as a spray guard to be held by the spray operator in protecting the surface from spray dust.

It is satisfactory to use the regularly employed striping materials over Duco prior to the application of wax to the finish. This striping material can be protected by the use of sheratone, manufactured by the Sheratone Products Co. This product can be brushed in over a stripe in just the same way as varnish would be used and dries to a lower degree of luster than varnish and gives equal protection to the stripe.

Stewart Brings Out a New 1½ Ton Speed Truck

THE Stewart Motor Corp. has brought out a new 1½-ton speed truck, to be known as Model 17, the chassis price of which is \$1,595. The new truck is furnished on a standard wheelbase of 145 in., but can be had with a special wheelbase of 160 in. The engine is slightly larger than in the previous 1¼-1½-ton model. It has 4 in. bore and 5 in. stroke. Large water space is provided for a thermo siphon cooling system.

Besides having full pressure feed lubrication, automatically controlled by the lever connected with a foot accelerator, the engine has a five-bearing crankshaft 2½ in. in diameter. All connecting rods and crankshaft bearings are bronze back babbitt lined. The cylinder head and the cylinder block are removable. Cast iron pistons are used.

A Zenith carburetor and Remy electric system, including starter, are furnished as regular equipment. The radiator has a heavy pressed steel shell with a removable cellular type core. The clutch is a multiple disk type with automatic adjustment.

A Gemmer worm type steering gear with spark and gas levers mounted on the wheel is used.

Spiral bevel gear and straddle mounted pinion are used

in the final drive. The rear axle is equipped with Timken bearings throughout, except for the pinion shaft, which is carried on annular bearings. The gear ratio is 6.24:1, but a ratio of 5.5:1 can be supplied if desired.

Service brakes are on the rear wheels, while the hand brake is mounted on the gearset. The drum is 4 in. wide by 8½ in. in diameter.

Wheels have cast steel spokes and Firestone demountable rims, upon which the tire equipment is 34 x 5 in. truck cord pneumatic. The same rims will take oversize 36 x 6, and with a special 20 in. cast wheel spoke wheel tires 32 x 6 or 34 x 7 can be fitted.

Four standard types of bodies are available: covered express, stake with vestibule cab, open express and special type combination stake and open express.

THE MOTOR, a British publication, describes an experimental car built by George Constantinesco to try out his torque converter in automobile service. He used an old chassis and fitted it with a 350 cu. cm. (21.4 cu. in.) single cylinder air cooled stock engine with which the torque converter is combined. The chassis is of narrow tread and is light throughout.

Volume Production Is Not Synonymous with Profit

The costs of making articles are not by any means the only, or even the most important costs, in the job of business. Decreased volume increases the expense of manufacture, but the decreased distribution usually more than offsets this.

By Harry Tipper

FOR twenty years the cost of distribution has been increasing rapidly. More and more of the purchaser's dollar has gone to pay the commercial costs and less to pay the manufacturing costs, but the automobile business did not notice this general trend, because of its rapid growth and the virgin market for its products. Now the manufacturer, jobber and retailer are beginning to find out that volume is not synonymous with profit and that cheaper manufacturing may be more than offset by expensive distribution.

Ever since the beginning of the mechanical era of industry the job of distributing the products has been absorbing more and more of the dollar. For a long time the fact was of no importance, because the increasing economies secured through the development of manufacturing machinery and methods of transportation enabled the industry to pay the larger bill for distribution and still sell at a lower price, while making a handsome profit.

Because the economies of manufacturing were the cause of so much advantage, and these economies came from the enlarged volume of operation, we have fallen into the habit of supposing that volume would solve any problem of price and profit. We have fallen into the error that manufacturing still is the controlling element in price making and that the manufacturing economies are as important as they were. Hence we have been obliged to learn by bitter experience that volume is no cure for economic troubles and that the costs of making articles are not by any means the only, or even the most important, costs in the job of business.

Called Attention to Distribution in 1900

As far back as 1900, John A. Hobson, the English economist, called attention to the constant enlargement of the machinery of distribution and the increasing difficulty in the marketing of products. He pointed out that, as the necessity for skill in industry became more definite and the opportunity to acquire such skill less visible, more and more of the less efficient workers would go into the distributing fields, where the required skill was not so severe nor the pressure so continuous.

In 1913 the writer pointed out that the downward curve of prices which ended in 1897 had witnessed a constant reduction in the percentage of manufacturing economies and a constant enlargement in the cost of distribution, so that the total cost of doing business began to rise in that year, continued in a steady ascent, and then the World War added the difficulty of inflation to the matter. The entry of the steam engine made a far bigger change in the machinery of industry than the discovery of electricity, and each new discovery, no mat-

ter how spectacular and startling, has less effect on the whole development.

Startling changes in cost, such as occurred every year for over fifty years after the discovery of steam, are not likely to follow the newer discoveries, and as a consequence there is little opportunity for the manufacturing economies to compensate for the increased difficulty and cost of distribution. Today there is a surplus of manufacturing capacity which is likely to continue while there is a slowing up in immigration and less tendency for the population to increase.

Lowering Prices Does Not Answer

The only way that the full volume can be sold is by the adoption of prices which will not pay the manufacturer a profit. Decreased volume of manufacture increases the cost of manufacture, but decreased volume of distribution usually decreases the cost of that distribution considerably more than the actual decrease in product. To put it the other way, up to the economic limit of management efficiency, increased volume from a single manufacturing unit tends to decrease the cost; whereas increased distribution tends to increase the cost.

Volume must be sacrificed in order to make profit under present conditions. Sacrifice of volume will permit of the following economies in distribution:

(1) Greater stability of price with less sacrifice of values in order to force out the full capacity of the plant.

Competition comes into its fullest and most destructive efforts when there is an attempt to maintain an artificial volume in order to keep the plants reasonably occupied. This competition not only slashes prices and attempts by all spectacular means to divert business from all other sources of supply, but it adds expense by searching out every possible avenue of sale with additional pressure in the endeavor to turn all possible purchasers into actual buyers.

(2) Less expense in providing the right number of outlet points.

Every retailer secured for a manufacturer has cost a definite sum of money to that manufacturer. Many concerns in industry in this country have too many accounts on the books, accounts which have cost a good deal to get and which must be maintained at great expense without a corresponding return in profit. There is a considerable turnover in every line of retailing, and this turnover involves the loss of a number of outlets, which must be replaced by the accession of new ones. This means additional expense. Proper securing of distribution means the development of a sufficient number of outlets of the right kind, stable enough to present a

minimum of turnover and capable of doing sufficient business to make the connection profitable.

(3) Less expense in developing and maintaining the market.

The effort to maintain large volume in the face of production surplus capacity leads to excessive combing of the territory in the endeavor to secure the ultimate sale from each area. This adds to the expense very rapidly. Factory representatives are added, in the hope of increasing the service of the jobber or the dealer. Special crews of men are sent out to comb the district. Service is added in more important centers, and methods of promoting through the retailer and to the public are multiplied by each of the manufacturers in the struggle, so that the expense of distribution is increased without any means of securing the return upon this investment in the price of the commodity. In fact, this very necessity leads to price cutting, or other methods of sacrificing the price, in order to make the proposition of the individual manufacturer more attractive. There are so many hunters after volume, and they become so energetic in their search, that the buyer becomes gun-shy and yields only to the most skillful and costly bargaining.

Consider the Turnover

The economies produced in manufacturing by the larger volume are more or less chimerical. They cannot be considered without also taking into account the number of times the capital is turned over, the number of turns made in the inventory, and the other elements which have a great bearing on the actual profit on the capital and consequently on the efficiency and economy of the business.

Generally speaking, the attempt to secure the volume of business by combing the market beyond its normal buying requirements results in the accumulation of larger inventories, with the consequent greater cost of the money involved and a slowing down in the turning over of the capital itself with the loss of this element of profit.

Business is at its most economical state when the amount of product turned out is just a little below the capacity to buy at that time. It is fairly economical so long as it does not go beyond this point for long, but when endeavor is made to hold up the market to maximum buying, although the conditions indicate that this can be done only through all sorts of expediencies which stimulate the market artificially, the result is far from economical and the apparent profits over one period must be paid for by the losses registered in another.

Offset Economies

In any case, the economies of volume lie mainly in the spread of the fixed charges over the production in the manufacturing establishments. These economies may be offset by the slower movement of inventory and the longer period between the time of investment in the raw material and the final closing of the transaction for the finished goods.

Economies in direct charges are more apparent than real. For instance, the direct labor in the case of one automobile of well-known make is about 18 per cent of the list price. A 10 per cent reduction in the labor cost, which would be a very large saving, would be less than 2 per cent on the list price, and as a consequence could be more than offset by a little extra necessity for sales pressure in order to get rid of the volume produced.

It is in the commercial costs that the difficulty really lies. The law of diminishing returns is always operating. It operates in the factory and in the sales field.

It says that, the more you have to comb the market, the more it will cost to get each order put through the works and finally delivered.

Filling the factory with orders will not provide a profit by itself. Glutting the market with second-hand cars in order to sell new ones will not provide a profit for next year. Crowding the product on the shelves of the retailer or putting a lot of pressure on the jobber will not add to the surplus, unless this is done in accordance with the normal requirement of the buyer.

Forcing Sales

The buyer can be teased into buying today what he would not purchase otherwise till next year. You can put enough pressure on him to make a lot of difference in the immediate volume. When the whole industry does this, however, it cannot be continually repeated with the same effort and at the same price. More pressure is required as the game becomes more complicated with competition, and the buyer must be cajoled, browbeaten and bedeviled in order to repeat in a measure what has been done just previously. Finally he just quits, and the papers begin to talk of a "buyers' strike," with the consequent almost fatal results to any industry.

The average manufacturer laughs a good deal at economic prognostications, and it is true that they are usually not in accordance with the way things turn out; but he would make more profit by studying the economist to the extent of trying to arrange his business in accordance with the probable requirements. The hills and valleys of business fluctuations would be less steep and dangerous and the dividend record would be more stable and continuous.

One of my friends, who is a farmer, has made his agriculture pay good dividends all through the time when the farmer's position has not been an enviable one. He has taken as his motto: Plant or raise what is plentiful and cheap today, because most of the farmers will be cutting down on it.

Profits Miserably Small

The economist who prognosticates is only talking of the probable conditions which the present suggests in view of the past. It is no trick to prove him wrong, but the trick is too costly to be worth much.

The automobile industry would be better off today if last year had seen a production of three million instead of four million vehicles. It will be better off tomorrow if it brings the production down this year so that the user will have a chance to catch up. The amount of money provided as profit to the manufacturer, jobber and retailer out of this \$5,000,000,000 business last year was miserably small. Some of the manufacturers and distributors made a good deal, but a vast majority must have gone through the largest year with no showing at all.

Enough production to provide everybody with a chance to make profit, stable prices, stable policies of selling which will cut down the retail turnover, and sane policies of promotion should be the guiding creed of all manufacturers in this industry.

OF the 1335 million metric tons of coal produced in the principal countries of the world in 1923, the share of the United States was nearly 581 million tons. Great Britain supplied 283 million tons. World production in 1922 was 1223 million tons and 1132 million tons in 1921. The percentage of the United States of the total was 43½ in 1923, 35½ in 1922, and 40½ in 1921.

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Pulling Together

CONTINUOUSLY high production for nearly two years has made it possible for the automotive industry to forget questions of labor turnover and efficiency to some extent. The human problems of industry remain much the same, however, in good times as in bad. When business slumps, the need for raising individual efficiency becomes apparent, although it may have lain dormant throughout the period of prosperity, obscured by issues of more immediate importance.

Stability of employment is one of the most potent forces in keeping workers loyal and enthusiastic. A factory in which labor turnover is high is almost certain to suffer inefficiencies as a result of the psychological reaction set up among those employees who do remain in the plant, as well as from the necessity of constantly training new workers.

Taking employees into the confidence of the management before general reductions or changes in forces are made, often offsets to a large extent the first of these difficulties. At a time when reports of depression are in the air, unfounded rumors of va-

rious kinds spread rapidly through every manufacturing organization. The best antidote to such rumors is a clear statement of facts from time to time by the management. The policy of letting the workers know what is going to happen and why, has worked out so successfully in many plants that its efficiency no longer can be seriously doubted.

Dealer Leadership

THE ability of the individual dealer or distributor is playing a more important part in selling automobiles today than ever before. Education and assistance from the factory is increasing materially, but factory domination seems to be growing less. There is an increasing tendency on the part of manufacturers to build their dealers into responsible merchants, capable of standing on their own feet in their own community.

There was a time when some car makers would have considered ideal a dealer organization which accepted the factory's word as law without question. Today the sort of dealer who is willing to permit somebody else to do all of his thinking for him is not being sought after. As the number of retailers has increased, the factories have found it more and more difficult to exercise a detailed control and more and more necessary to have dealers who can and will stand on their own feet. They have found that this type of man, while sometimes argumentative and loath to accede to every factory request, possesses those qualities of initiative and responsibility which are likely to make him successful in selling automobiles and in running his business at a profit.

The factories which are having the greatest success in handling their distribution are those which have operated toward their wholesalers and retailers as leaders rather than bosses. By consistently giving the dealer efficient service in connection with the necessary routine of the business and by lending a helping hand whenever needed, these manufacturers have found it relatively easy to get cooperation from the distributing organization whenever they desired to put into effect some policy vital to their well being.

Engineering Nomenclature and Definitions

IN connection with standardization work a good deal of attention has been given recently to definitions of technical terms. The Iron and Steel Division of the S. A. E. Standards Committee, for instance, has in hand the definition of terms commonly used in connection with metallurgical operations, and a subcommittee of the A. G. M. A. Standards Committee is doing similar work with respect to gear terms.

To draft suitable definitions is not nearly as easy a matter as would be supposed. This is largely due to the fact that terms which really have a very broad meaning are often used in a very much more restricted sense. The word "annealing," for instance, applies to any process for rendering a material

softer, and describing the process employed in softening steel would hardly give a sufficiently broad definition. The same thing applies to gear terms. By far the most widely used type of gear is the spur gear, and when mention is made of a gear tooth or an element of a gear tooth we instinctively think of a spur gear. This may not apply to people specializing in some other form of gearing, but correctly portrays the mental processes of the average engineer. However, when a definition of a gear term is set up it must apply not only to spur gears, but also to bevel gears, helical gears and herringbone gears.

Not only must the definitions be technically correct, but they must be as clear and concise as it is possible to make them. Precise definitions are a great help in educational work and they also help in preventing errors in the shop.

Profits the Chief End of Business

IT is general knowledge in the industry that car manufacturers are operating on much narrower margins of profit than they were a few years ago. While it is difficult to figure out from published financial statements the exact profit per car, a general picture of the situation can be obtained. In the case of many important companies a comparison of profits with production shows that the net income per car was considerably smaller in 1923 than at any time for the past six years, with the exception of 1921.

The net income figures include, of course, many items not bearing on the cost of building and selling the car itself, but the comparison does give a picture of a trend clearly enough to indicate that the economies accruing from increased volume have failed to offset the rapid increase in marketing costs in recent years. Data on six prominent, well established companies, for example, show that the net income per car in 1923 was less than in 1922 in every instance, despite the fact that the latter year witnessed the largest production in the history of the industry.

It is often argued that greater volume may reduce profit per car but at the same time increase the total of net income. But the statements of the six companies referred to show that total net income in 1923 was greater than in 1922 in only three out of the six cases. The profits of one company were about the same for the two years, while 1923 recorded a decrease in two instances. Not in a single case did total net profits advance in proportion to the production gain.

Increase in volume of production does decrease overhead and reduce costs up to a certain point. To determine when the point at which diminishing returns sets in requires a very close and constant study of the relation of manufacturing and marketing costs.

Through remarkable achievements in quantity production the automotive industry has been able to give cheap and efficient transportation to the world. The service performed to the human race by volume manufacturing methods has been very great. But the normal growth of the automobile into its place as an integral part of American social and economic

life has finally brought about the need for a readjustment of emphasis.

The balance sheet is the final arbiter of automotive destinies, and marketing costs have a major place today in determining profits. Production economies must be continued, but major emphasis should be shifted to the problem of cutting sales costs.

This Is Why They Shimmy

WE are inclined to doubt whether, as many believe, balloon tires cause shimmying. We do believe, however, that many if not most modern passenger cars and trucks have a certain inherent tendency to shimmy and that the lower internal friction of the balloon tire permits this tendency to manifest itself in some cases, whereas a stiffer tire, that is, one with greater internal friction and more lateral stability, may, because of these qualities, prevent a tendency to shimmy from manifesting itself.

Changes in a steering system calculate to reduce friction or make the car steer easier have resulted in shimmy, simply because the retarding force of friction counteracts the forces which tend to cause shimmy. Much the same appears to be true in respect to tires.

The way to cure shimmying is to treat the basic cause rather than the symptoms of the disease.

Readers of these columns will recall that there appeared on this page about eighteen months ago an editorial entitled "What Makes 'Em Shimmy?" and that, as a result of this question, we received and printed several letters and two or three articles giving various views in this regard. The subject finally was summarized in an article entitled "A Critical Study of Modern Steering System Design," in which the following, among other, points were brought out:

"If the front wheels of a vehicle be in equilibrium, with respect to the knuckle pivot, in all angular positions of their spindles when the vehicle is in motion, wobble will seldom occur, provided the layout of the draglink and spring is correct. But when the knuckle pivots are inclined in either a transverse or longitudinal plane, the wheels are in equilibrium in only one position, and if deflected from that position they tend to swing back to and past it, oscillating in pendulum fashion unless the motion is damped out by friction. Consequently, any chassis in which the knuckle pivot is tilted has at least an incipient tendency to wheel wobble.

The three primary causes of wobble appear to be: 1—Unstable equilibrium of wheels carried on knuckles with inclined pivots; 2—Faulty layout of draglink in reference to springs; 3—Lack of balance or failure of a wheel (tire included) to run true.

In addition, a number of factors add to or help set up wheel wobble or render it more severe when once it is started. Those cited in the article in question include:

1—Loose or very free steering connections or other factors tending to decrease friction. 2—Insufficient stiffness in any parts of the steering system or its supports. 3—Gyroscopic forces.

The quite general adoption of front wheel brakes and approximate center point steering, involving the use of transversely inclined knuckle pivots, probably has increased the tendency of many cars to shimmy. Tires which are unbalanced, whether they are balloons or some other type, have a similar if less pronounced tendency, but otherwise there is good reason to doubt whether tires are at fault in this regard.

New York, Roused by Congestion, Sets Out to End Traffic Problem

More Than Nine Hundred Delegates from Four Hundred and Eleven Municipalities in Vicinity of City Meet in Conference and Discuss Situation

NEW YORK, May 21—Father Knickerbocker, aroused to the necessity of devising ways and means of solving the traffic congestion problem not only in Manhattan but also the surrounding country, tackled the subject in earnest yesterday when more than 900 delegates, representing 411 municipalities, met and discussed the present situation and made plans for the future.

The meeting was called by the Committee on a Regional Plan of New York and Its Environs, and the delegates were representatives of municipalities embraced in the region, which includes 5000 square miles and takes in New York City, Long Island, Westchester and parts of New Jersey and Connecticut.

The main action taken was the passage of a resolution urging the appointment of an advisory committee representing the region, which in turn would appoint an executive committee to work in harmony with the regional plan committee.

Mayor Hylan of New York City, Governor Silzer of New Jersey and other dignitaries took part in the discussions, and the experts predicted radical innovations, such as express highways, which would develop seven times the capacity of modern streets, arcaded elevated sidewalks, one-way streets and the abolition of elevated structures, while Mayor Hylan reiterated his policy of scrapping the surface car lines.

Of particular interest to the automotive industry was the report of Ernest P. Goodrich, consulting engineer, and Harold M. Lewis, executive engineer of the committee, which receives financial support from the Russell Sage Foundation. The foundation has agreed to an expenditure of \$100,000 a year for five years to promote the work.

Congestion Is Costly

Probably the most sensational discovery of the investigators was that the cost of street traffic congestion on Manhattan Island is estimated at \$500,000 a day, and the cost of congestion in the area known as the Region of New York and Its Environs is estimated at \$1,000,000 a day. This compares with \$200,000 daily in Chicago, \$100,000 in Cincinnati and \$35,000 in Worcester, Mass. It was on these three reports that the estimate of \$500,000 daily for New York is based.

The investigators also stated that 223,450 vehicles enter Manhattan south of Fifty-ninth Street during twenty-four hours of a typical business day, of which 132,800, or 59.4 per cent, come from the Bronx and Westchester County; 57,940, or 25.9 per cent, from Brooklyn, Queens and the rest of Long Island, and 30,300,

or 13.6 per cent from New Jersey by ferries south of Fifty-ninth Street.

As the investigators see it, the causes of traffic congestion in this section can be summarized as follows:

- (a) Narrow streets from former times.
- (b) Building heights too great for the capacity of adjacent streets.
- (c) The lack of zoning with reference to use, height and bulk of building, so as to preclude the creation of traffic congestion caused by the use of the streets by such building tenants, especially at morning, noon and evening hours.
- (d) The lack of plating ordinances which would prevent the creation of new subdivisions with streets which are too narrow for their ultimate use.
- (e) The inadequacy of arterial thoroughfares both present and postponed.
- (f) The lack of a comprehensive plan within which can be included each of the several creative and preventive measures suggested above.

(Continued on page 1150)

Cut of 2½ Per Cent in Parts Excise Tax Voted by Conferees

WASHINGTON, May 22—Unanimous agreement was reached on Wednesday by the conferees on the tax reduction bill, after a bitter fight over the automotive section, with the result that the Senate's elimination of all the 5 per cent tax on parts and accessories was defeated and the House's provision of 2½ per cent was rewritten in the bill.

The action of the conferees was almost a complete victory for the House, but means that Congress as a whole refused to recognize the fact that the tax on parts and accessories is a nuisance tax and should have been repealed in toto. The House's cut in the automobile tax section would have amounted to \$25,000,000, while the Senate's action would have made the reduction substantially \$10,000,000 more.

The bill, which was reported by the conferees, and which will become the law under which the automobile industry will pay its excise taxes effective 30 days after it is signed by the President, is as follows:

There will be a 3 per cent tax on automobile truck chassis and automobile wagon chassis sold or leased for an amount in excess of \$1,000 and automobile truck bodies and automobile wagon bodies sold or leased for amount in excess of \$200, including in both cases, tires, inner tubes, parts and accessories sold in connection with the purchase.

There will be a tax of 5 per cent on automobile chassis and bodies and motorcycles and a tax of 2½ per cent on tires, tubes, parts and accessories.

Passage of the soldiers' bonus, under which the Government must raise annually \$135,000,000 is directly attributed to the fact that the conferees deemed it necessary to cut the tax on the automobile section \$10,000,000, as well as nearly a hundred other changes which substantially increased the revenue of the Government. Had the Senate sustained the President's veto of the bonus, unquestionably the conferees would have eliminated the tax altogether on parts and accessories.

The conference report will be taken up by the Senate on Thursday or Friday and if approved it is expected that the House will be able to act on Saturday or Monday. Little time is expected to be taken in debate in either body and there were indications that practically no opposition would be offered either to the automobile section or any other provisions of the act.

G. M. to Sell 2 Plants Located in New Jersey

NEW YORK, May 19—Two plants at Bloomfield, N. J., one occupying 98,400 sq. ft. of floor space on six acres of ground, and the other 174,000 on 14 acres, owned by the General Motors Corp., although never used by it, have been placed on the market.

These plans are two of four built by the International Arms & Fuse Co., which were bought by General Motors when W. C. Durant was president with the idea of locating there the GMC truck plant, which now is at Pontiac, Mich. This move never was made, the four buildings remaining idle until the Klaxon Co., having to move, took over two of them, which it still uses. The other two are those now offered for sale.

Senate Not to Consider Ford's Offer for Shoals

WASHINGTON, D. C., May 22—Henry Ford's bid for Muscle Shoals was rejected Wednesday afternoon, May 21, by the Senate Agriculture Committee in executive session, 10 to 6. It still may be brought up as a substitute on the floor of the Senate, however.

Senator Harrison of Mississippi, one of Ford's strongest supporters, moved that the committee report the offer without recommendation. The motion was defeated. The committee then voted to close its hearing on all bids Monday and to consider them in executive meeting Tuesday. The defeated members of the committee plan to try to obtain another vote on the Ford bid Tuesday.

Prices to Be Higher First of Next Month

Will Be in Lines in \$1,500 Price Class Due to Lower Output Schedules

DETROIT, May 20—Prices will be increased in several lines of cars the first of June, according to information from executives of companies which are planning increases. These statements are made without thought of their possible effect upon business during the present month and are not being circulated for this purpose. They are indicative of the rearrangement of production schedules with new prices based upon these lower totals.

As indicated earlier these changes will be in lines approximating the \$1,500 price class. Changes may be made in some of the lower-priced lines, but there are no indications of this now. Manufacturers in low-priced lines are not expecting reductions of schedules to points making higher prices necessary. One maker of a low-priced car has declared that the higher prices would have serious effects on buying and therefore are not to be considered.

There is still a great deal of feeling in the industry that better weather will witness a large increase in the volume of business. Executives generally are unwilling to concede that business is slowed down indefinitely and for that reason are hesitating about making any plans for the balance of the year. If the appearance of good weather fails to develop an improvement in general market conditions, then makers will make definite plans.

Hope for Used Car Improvement

What manufacturers are looking for more than anything else is an improvement in the used car situation. Good weather alone will get used cars going in the quantity necessary for satisfactory movement of new cars and in the absence of this there is much question as to what will develop.

Manufacturers are giving dealers all possible support in moving their stocks of new cars. The reduced factory schedules are the most important evidence of this, but in addition, merchandising plans are being put over from the factory solely with the idea of getting dealers out of difficulties occasioned by stored cars.

One manufacturer has advanced a large part of the advertising appropriation over from the latter part of the year to help move cars now.

WISCONSIN FARM RECEIVER

SAUK CITY, WIS., May 19—E. M. Doll of Baraboo, Wis., has been appointed receiver of the Wisconsin Farm

Personal Tastes of Buyers and Strength of Dealer Organizations Are Big Factors in Sales

AN INTERVIEW WITH W. D. ROCKWELL,
Director of Sales of the Parsons Manufacturing Co.

By D. M. McDonald,
Detroit News Representative of the Class Journal Company

Detroit, May 21.

If there is such a thing as luck in the automotive industry, then the lucky ones are getting the business, for there certainly is a large amount of business going on despite the stories of severe curtailment, declared W. D. Rockwell, director of sales of the Parsons Manufacturing Co. In the case of his own particular company, Mr. Rockwell said operations at the present time are at peak levels and orders for the next few months give every indication that this will continue to be the rule. Call it luck, he said, but the orders are there, and the company is shipping its product just as fast as it can turn it out.

Eliminating all consideration of luck, however, and viewing the situation entirely from a hard and fast business standpoint, Mr. Rockwell stated that the real truth of the matter probably is that the majority of car companies which the Parsons company is supplying did not accumulate stocks during the winter months to the extent that many companies did.

As a result of this, he said, these companies are now supplying practically all of present retail business direct from the factory, instead of supplying only part and drawing on the winter surplus for the balance. Factory production at present is no barometer of retail sales because of the reserve stocks accumulated which have to be cleared off. Practically every car manufacturer is getting his proportionate share of the retail business, said Mr. Rockwell, although factory operations may show wide variations.

Though general developments of the spring business to date would appear to argue against the wisdom of heavy winter operations, there are no two years which may be judged alike, according to Mr. Rockwell. The same stock of cars which has been slow in moving this year, would have been quickly absorbed last spring and next spring may see a similar shortage. If the calculations of manufacturers who built up stocks this year are correct, the first period of good weather will see the end of the present stocks.

One safe conclusion that may be drawn from the present experience, Mr. Rockwell said, is that the ability to deliver cars by any particular manufacturer, or group of manufacturers, does not mean that all the buying will be confined to this one maker or group. Every manufacturer is getting a good share of business this year, according to the personal tastes of buyers and the ability of dealer organizations to sell. As long as there are individual preferences and capable dealers it is reasonable to suppose that all responsible makers will get proportionate shares of the current business.

Tractor Co. of Sauk City, on petition of a group of creditors. Not long ago a stockholder who also is a creditor brought an action in the State courts, and this has been followed by a receivership as a protective measure. The concern has been in business about five years.

Chevrolet Prices Rise Following Prediction

NEW YORK, May 20—Following the prediction of higher prices in the near future, made a week ago by President A. P. Sloan, Jr., of General Motors, the Chevrolet Motor Co. announces advances in its line of open models of from \$5 to \$15. The list follows:

	New price	Old price
Roadster	\$495	\$490
Phaeton	510	495
Special phaeton	640	625
Chassis	410	395

AIRCRAFT MAKER BANKRUPT

NEW YORK, May 20—A voluntary petition in bankruptcy has been filed in the United States District Court by the Interallied Aircraft Corp., listing liabilities of \$184,885 and assets of \$4,236. The largest creditor is the Chase National Bank, with a claim of \$103,281.

A. E. A. Reserve Fund Has Reached \$72,000

DETROIT, May 21—Directors of the Automotive Equipment Association, in mid-convention session here this week, were informed by Commissioner William M. Webster that the association's reserve fund, which is to be built up to \$120,000, has passed the seventy-two thousand mark.

The board considered the Canadian membership situation and adjourned to meet in Toronto, where a meeting will be held with a number of Canadian members, both manufacturers and jobbers. The board talked over plans of serving the Canadian membership in the best possible way.

The executive committee of the Research Club, a group of non-competing jobbers in twenty-one cities, met here this week and authorized a special merchandising campaign on research brand products. The campaign will be conducted cooperatively and by the individual jobbers. The meeting was presided over by E. R. Seager of the Pennsylvania Rubber & Supply Co. of Cleveland, president of the club.

Committee Handles Bowser's Finances

Represents Bank Creditors—Business Will Continue Without Interruption

FORT WAYNE, IND., May 21—A committee of five financiers representing New York, Chicago and Cleveland bank creditors of S. F. Bowser & Co., Inc., has been named to take charge of the financial affairs of the company for a period of six months, so that the company's finances will not be impaired by the necessity of redeeming certain commercial paper, which will fall due during that time.

The plant will continue to operate as usual. Announcement of the creditors committee was made here by representatives of the Bowser company.

The committee is composed of R. F. Newhall, chairman, vice-president of the First National Bank of Chicago; Carl J. Schmidlapp, vice-president of the Chase National Bank of New York; E. A. Potter, Jr., vice-president of the Guaranty Trust Co. of New York; A. E. Hamill of Hathaway, Smith, Folds & Co., Chicago, and W. C. Macfarlane of Hitchcock, Bard & Co., of Chicago.

It is explained here that the condition which now exists came about as the result of the rapid expansion of the plant during the last few years, which made necessary the securing of a large amount of capital. A part of the commercial paper put out by the company is coming due and, while the concern has assets of more than \$5,000,000, in excess of its liabilities, it is said, it has not the ready cash to redeem the paper without liquidating some of its assets.

Steps to Be Taken by Committee

One of the first steps to be taken by the creditors committee will be the preparation of a financial statement for the company, and a request that those having commercial paper falling due soon postpone its collection for six months. In the meantime, it is believed, the company will be able to convert a large amount of its raw material into finished products and to put the finished product on the market, thereby raising the money to satisfy creditors who hold matured paper.

The committee also plans to secure such credit as is needed by the company from other banks.

Local banks have issued statements saying there is no cause for alarm in the action being taken in regard to the Bowser concern.

UNIVERSAL TRACTOR SALE

MOLINE, ILL., May 20—The Universal Tractor plant and machinery, valued at \$1,500,000, will go on the auction block May 27, 28 and 29, with Samuel L. Winternitz & Co. and Michael Tauber & Co., Chicago, in charge. The Moline Plow Co., owner of this Rock Island branch

TRUCK-TRACTOR DATA SOUGHT FROM FARMER

SPRINGFIELD, ILL., May 21—A comprehensive survey of labor-saving machinery, particularly tractors, plows and trucks, is being undertaken this summer by the Department of Agriculture in conjunction with the University of Illinois college of agriculture. Forty-two queries, covering every angle of power application to farm activities and development, are included in the questionnaire, which is being directed to farmers.

A. J. Surratt, directing the survey, in an explanatory note with the questionnaire, says: "Information at hand is not sufficiently complete for broad study and research work. Particular attention is given to the advantages offered through further expanding the use of labor-saving machinery on farms, with a view to lessening the high cost of growing difficulties presented by the farm labor problem in recent years."

of tractor production, has offered this with its Freeport and Poughkeepsie plants for sale. Parts, tools, equipment, factory pieces, motors and office equipment are in the various job lots to be offered.

Thomart Plant at Kent Sold to Fageol of Ohio

AKRON, May 21—Attorney Francis Seiberling, receiver for the Thomart Motor Co. of Kent, Ohio, has sold the plant to the Fageol Motor Co. of Ohio, for \$81,000 cash. The sale was made after two efforts had been made to dispose of the plant at public auction.

Mr. Seiberling stated that while he had no official information regarding the plans of the purchasing company he understood the company will use the plant for the production of buses.

The Thomart Motor Co. was started during the boom period to manufacture trucks.

White Reelected Head of Cleveland Tractor

CLEVELAND, May 19—at the annual meeting of the Cleveland Tractor Co., the \$100 shares were changed to no par value. The authorized amount was cut from 60,000 to 50,000 shares, but the outstanding remains unchanged.

Rollin H. White was reelected president; R. T. Hodgkins, vice-president, and C. D. Fleming, secretary-treasurer. The following directors were named: Mr. White, Mr. Hodgkins, E. E. Allyn, R. T. Sawyer, F. W. Goakes, E. R. Smead, J. H. Champ, W. P. King, Severance Milliken, Grover Higgins and R. B. Tewksbury.

Overland to Clear Books of Bank Debt

Action Will Be Taken in May and June, Leaving Only Funded Indebtedness

TOLEDO, May 19—Bank indebtedness aggregating \$4,200,000 will be paid off by the Willys-Overland Co. during May and June, according to the announcement of officials of the company here. This will clear the company's books of all debt except that which is funded.

This will remove another obstacle to payment of back dividends on preferred stock and enable early consideration of that proposition.

Net earnings for the first quarter of the year were \$2,160,519 which is equivalent to \$9 a share on outstanding preferred stock.

So far during the second quarter of the year sales have been outstripping the corresponding period a year ago, when a record high mark was set. Earnings, too, are higher than in the first quarter of the present year.

April sales were satisfactory and a high mark was set during the last week of that month.

Ford Sells Its Former Chicago Assembly Plant

CHICAGO, May 20—The Ford assembling plant at Wabash Avenue and Pershing Road has been sold to Ward T. Huston of Ward T. Huston & Co., real estate broker, for a consideration said to be \$1,133,000.

Formal transfer on paper of the property will be followed in October by a big Ford moving day when the Pershing Road establishment's stock and equipment will be started for the new assembling plant at Hegewisch.

This move on the part of the Ford company will put all its Chicago assembling operations under one roof. Contracts for additional construction at Hegewisch were let some time ago and when executed will double the plant space and facilities.

Eventually the Pershing Road plant will be occupied by the Peoples Gas Stores, Inc., as a central service station for the Chicago district and warehouse.

Great Western Motors Buys Fageol Tractor

SAN JOSE, CAL., May 21—The Great Western Motors, Inc., of this city has purchased the Fageol tractor division of the Fageol Motors Co., located at Oakland.

The Fageol tractor has been increased in price from \$1,200 to \$1,225. Since its manufacture was taken over by the Great Western Motors, many improvements have been incorporated, and an engine governor has been added as standard equipment.

Operations Continue on Midwest Engines

Arrangements Are Concluded by
Three Manufacturers for Pro-
duction of Them

MILWAUKEE, May 19—Announcement is made that two Milwaukee and one Stoughton, Wis., manufacturer have concluded arrangements whereby the Midwest line of heavy duty truck, bus and tractor engines will be continued in regular production and service.

The Allis-Chalmers Manufacturing Co., Milwaukee, has purchased the rights to build and also the production equipment, tools, jigs, etc., for the 4½ x 5¼-in. Midwest engine, which is used in the A-C 12-25 tractor. The engine also will be supplied to other manufacturers by Allis-Chalmers.

The Stoughton Wagon Co., Stoughton, Wis., has taken over the equipment and production rights affecting the 3½ and the 3¾-in. models, used in the lighter Stoughton trucks, and also has bought tool equipment for adapting the 4½ x 5¼-in. model to its needs, the engine to be furnished by Allis-Chalmers.

The Waukesha Motor Co., Waukesha, Wis., takes over the manufacture of the 4½ x 6 and the 4½ x 6-in. Midwest engines, but only as contractor. The rights and equipment were acquired by the Huber Manufacturing Co., Marion, Ohio, builder of the Super-Four tractor, and the J. B. Brill Co., car builder, Philadelphia, which have turned over the equipment to Waukesha to have these types built on contract.

Court Adjudges Partners in Better Tires Bankrupt

CHICAGO, May 19—Charles S. Peterson and M. Silverman, copartners in the Better Tires Corp., have been adjudged bankrupts by Federal Judge Adam C. Cliffe. The court's action followed a petition filed May 3 by Mr. Silverman which marked the climax of rough sailing for the corporation.

It was declared in this petition that Mr. Peterson's personal liabilities were in excess of \$1,000,000 and that his indebtedness would outbalance his assets by more than \$500,000. It is estimated that the assets of the corporation are around \$400,000 with liabilities about \$1,100,000.

At the close of the hearing Carl R. Latham, attorney for Mr. Peterson, issued a statement in which he said that his client is positive his assets, if properly administered, will more than meet all claims.

FRANK C. CALDWELL DEAD

CHICAGO, May 19—Frank C. Caldwell, a director of the Link-Belt Co. since the purchase of the H. W. Caldwell & Sons Co. by the latter in 1921, is dead of heart failure. Mr. Caldwell was vice-

president of the Caldwell company from 1892 to 1908, when he became president, a position which he held until the Link-Belt company bought the Caldwell company. He also was president of the National Metal Trades Association in 1911-1912 and served as its treasurer from 1912 to 1922.

Bid for Fox Property Held too Low by Court

PHILADELPHIA, May 21—On petition of Charles S. Rockey and G. K. Olberg, receivers for the Fox Motor Car Co., whose property at Seventh Street and Grange Avenue was bid in at public auction for \$230,000, Judge Dickinson in Federal Court has refused to confirm the sale.

The receivers set forth that it is necessary for the property to bring at least \$325,000 to pay off the first and second mortgages and comply with the court's decree. The Kensington Trust Co. is holder of the first mortgage, which is for \$150,000, with 6 per cent interest. The petitioners ask leave to proceed to execute on the judgment. It is regarded as probable that the property will again be placed on public sale in June.

Insolvency Admitted by J. F. Davis & Sons

MILWAUKEE, May 21—The J. F. Davis & Sons Co., DePere, Wis., manufacturer of special metal wheels for motor trucks, buses, tractors, etc., and conducting a large structural fabricating and boiler works, has admitted insolvency by filing schedules in response to an involuntary petition in bankruptcy filed recently by three creditors.

Liabilities totaling \$333,035 are admitted, and assets amounting to \$309,997 are claimed.

Unsecured claims amount to \$326,491 and consist largely of loans made by banks and officers. The Stopshok Wheel Co., DePere, which handled the output of truck wheels, has a claim of \$14,000.

Assets include real estate valued at \$55,000; stock in trade, \$115,000; bills, notes, etc., \$46,079; machinery and tools, \$85,000, and debts due on open account, \$8,215. The item of cash on hand and in banks is scheduled as \$3,61.

The Davis plant at DePere originally was built by the Lyons Boiler Works, which failed with large liabilities a number of years ago. Since then the property has changed hands twice and the Davis interests took it over about four years ago.

HARVARD BUREAU SURVEY

BOSTON, May 21—The Harvard Bureau of Business Research, which is conducting a survey of costs of doing business in the wholesale automotive equipment business and the retail tire business, has received replies to its questionnaires from 133 jobbers and 151 tire dealers. It is expected that tabulations on the two trades will be completed within a few weeks.

Mason Tire Reports Loss on Operations

Profit of \$144,840 for 1923 Reduced to \$535,774 Deficit Through Deductions

AKRON, May 21—The Mason Tire & Rubber Co. reports an operating profit of \$144,840 for 1923, but after interest charges, shutdown and miscellaneous expenses, the annual statement shows a net loss of \$535,774.

The balance sheet shows an increase in good will and organization expense of \$250,446. This is accounted for by the fact that certain expenses totaling \$342,333 were capitalized, and a State tax of \$10,000 was levied on the increase of Series B common stock.

May business is running ahead of April, which was 13 per cent greater than that of April, 1923. Costs have been reduced and earnings are increasing, according to the officials of the company. The balance sheet is reported as follows:

ASSETS	
Cash	\$358,723
Accts. notes, accept. rec.	424,221
Inventories	1,716,824
Current	\$2,499,769
Deferred	306,384
Claims for Federal tax refund	47,939
Investments	174,760
Property, depreciated	4,321,277
Goodwill, organ, expense	1,483,502
Total	\$8,833,634
LIABILITIES	
Notes, accts. pay.	\$771,515
Accrued wages, net	107,049
Current	\$878,565
Preferred dividend warrants pay.	196,084
Mis. reserves	155,199
First mortgage 7%	2,000,000
Preferred stock, 7 per cent	5,991,880
Common stock, no par, 100,000 shares, series A	500
Series B, 133,584.4 shares	388,594
Deficit	388,594
Total	\$8,833,634

Balloons in Big Demand by Rickenbacker Buyers

DETROIT, May 20—The Rickenbacker Motor Car Co. reports demand for cars running almost 100 per cent for balloon tire equipment, following its offer of balloons as optional equipment on its regular run of models. The price for the balloon tire equipment is \$100 extra, this including five tires. The company is using a 5.77 type tire on a 22-in. wheel.

Dealer stocks of cars with the regular tire equipment are reported by the company as being low, so that there will be no necessity of shipping balloon tires and wheels to replace existing equipment. Indications from present demand are that the balloon tire business will dominate all buying.

Fokker's Operations Wait on Government

Will Start in New Jersey When Army and Navy Appropriations Are Voted

WASHINGTON, May 19—Manufacture of Fokker airplanes in the recently purchased plant of the Wittemann Aircraft Corp. at Hasbrouck Heights, N. J., by the Atlantic Aircraft Corp., will start as soon as the new United States Army and Navy appropriations are passed, it is understood here, and the new company will compete for the Government airplane and engine contracts.

Two planes were sent to the War Department two years ago for testing purposes and as a result of the favorable report given the Fokker interests decided to establish a factory in this country following the receipt of several repeat orders from the United States Air Service.

Anthony H. G. Fokker, designer of the Fokker airplane, feels that there is a fine opportunity for him in this country, for he believes commercial aviation, already practical in Europe, will be only a matter of a few years in the United States.

He says:

The practical American does not consider that aviation is ripe enough in this country to venture money on it. That is one of the reasons why such a great country as America, which according to European ideas should be just the very land for such a service of airplanes for goods and passengers being carried on regularly, is practically virgin soil in this respect.

It is true many efforts have been made in that direction which have created a bad impression concerning the chances of success being attained. There are, however, various signs that commercial aviation within a short time will also become strongly developed in America.

Kelly Will Assist Owen in Automotive Division

WASHINGTON, May 21—H. H. Kelly, statistical expert of the automotive division of the Department of Commerce, has been appointed assistant chief of the division, succeeding M. H. Hoepli, acting chief, who resigned recently to go with the General Motors Corp.

Mr. Kelly for a number of years has been engaged in statistical and reportorial work connected with papers in Pittsburgh, Braddock and Wilkinsburg, Pa. He joined the staff of the automotive division on Nov. 1, 1923. Percy Owen is chief of the division.

GREENFIELD TAP OPERATIONS

GREENFIELD, MASS., May 21—The Greenfield Tap & Die Corp. is operating its factories on reduced time owing to the business slow-down. Four days a week is the schedule in many departments.

Business in Brief

NEW YORK, May 21—Weather continues to play an important part in business conditions, retail sales of commodities being affected materially by this factor. There has been somewhat of an upward trend in wholesale buying, but caution still prevails in this branch of trade.

Crops, likewise, have suffered because of adverse weather conditions, spottiness being evident in the reports coming from widely scattered agricultural areas. Various parts of the winter wheat belt are reporting favorably on the probable outcome of the crop, but trade is light.

Scarcity of cotton has resulted in a curtailment of operations in textile mills and has brought the price back to 31 cents in portions of the South. This has given rise to a more optimistic feeling in those sections of the country, with the resultant pick-up in retail trade. Better weather is improving the cotton-growing situation. Export business in this commodity showed a strong advance this week.

There has been a broadening in wool buying with prices quoted lower than a year ago.

Coal mining operations have been reduced, particularly in mid-western fields. The same conditions prevail in the iron and steel industry.

The passage of the bonus over the Presidential veto caused a depression in leading industrial stocks. This was due not so much to the action of Congress on this particular measure, but to the possibilities of unfavorable action on pending tax legislation, as a result of the passing of the bonus bill.

Business as a whole continues to wait for the adoption of a definite tax program.

Stearns New Six Line to Carry Lower Prices

CLEVELAND, May 21—The F. B. Stearns Motor Co. announces that it will place on the market June 7 a complete new line of light six-cylinder cars that will sell for approximately \$1,800 to \$2,400. The present line of sixes, selling at higher prices, will be continued, as will the four-cylinder line.

The new light six line will include a sport coupé, a four and five-passenger phaeton, five-passenger sedan, coupé brougham and five-passenger brougham. The company has been finding a ready market for its present line of sixes, but decided to extend its market into the class of people who buy lower priced cars.

Wickwire to Adjust Financial Structure

More Working Capital Required, President of Company Tells Stockholders

NEW YORK, May 19—Stockholders of the Wickwire Spencer Steel Corp. have been notified that additional working capital is required, which makes necessary an adjustment of the financial structure of the company, President T. H. Wickwire stating in his annual report that this will "relieve it for a time of certain burdensome capital payments, and which will thus enable it to conduct its business free from embarrassments which have hampered it in the past two years."

The general balance sheet of the company shows working capital of \$4,119,984, which, it is declared, is not sufficient for the volume of business now being transacted. Inventory is valued at \$8,488,785. Cash on hand totals \$305,276. Gross sales in 1923 totaled \$27,548,268, against \$17,282,574 in 1922, and net operating profits of \$2,840,531, compared with \$973,102 the previous year. After crediting other income and allowing for bond interest, depreciation reserves and other charges, net income was \$351,353 for 1923, against a loss of \$840,264 after the same deductions reported on the preceding year.

Statement of President

The report of President Wickwire continues:

As a result of the industrial depressions of 1921 and 1922, your company suffered large losses. These losses combined with required expenditures for sinking funds and similar necessary capital payments seriously impaired working capital and left a working capital insufficient to carry on the increased business which followed the depression.

The company's financial situation became acute in the latter part of 1923. The banks, however, at that time extended their loans in order that all interested parties might endeavor to work out a plan which would solve the company's financial difficulties.

Auto-Lite Earns \$2.77 Share in Four Months

TOLEDO, May 21—The Electric Auto-Lite Co., in announcing the declaration of its regular quarterly dividend of \$1.50 on common stock, payable July 1 to holders of record June 14, reported that net earnings in the first four months of this year were \$694,777, after interest, depreciation and taxes. This is equivalent to \$2.77 a share.

Since Jan. 1 there has been retired \$210,000 of the first mortgage bonds, leaving only \$1,000,000 now outstanding. This amount will be retired in the next twelve months, according to present plans. The bond issue of \$3,500,000 was put out at the time of the purchase of the plant from the receivers of the Willys Corp. in July, 1922.

Men of the Industry and What They Are Doing

Hanson with Republic Truck

Walter P. Hanson, formerly advertising manager of the Haynes Automobile Co. and later holding the same position with the Stutz Motor Car Co., has succeeded J. L. Brownell as advertising manager of the Republic Motor Truck Co. of Alma, Mich.

Lang Appointed Sales Manager

Otto C. Lang, with the Hydraulic Brake Co. of Detroit since its incorporation as the Four Wheel Hydraulic Brake Co. in 1919, has been made sales manager of the company. He has been associated with Malcolm Lockheed, inventor of the Lockheed hydraulic system for more than ten years.

Coleman Handles Rollin in Europe

J. Barrett Coleman has been assigned to look after Rollin sales in the British Isles and the Continent, with headquarters at the Royal Automobile Club, London. Mr. Coleman started with the Packard Motor Car Co. in 1906 and joined the Cadillac organization a year later. In 1909 he was associated with the Studebaker organization, operating in the domestic and export departments, spending three years in the Far East and Europe. From 1916 to 1919 he was treasurer of the Clydesdale Motor Truck Co., handling the export end.

D. Minard Shaw Joins Agency

D. Minard Shaw, who has been in charge of advertising of the Eastern division of the Ford Motor Co., has retired to become vice-president of the advertising agency of Jules P. Storm & Co. Mr. Shaw is a veteran who first formed contact with the automobile industry as vice-president and sales manager of the MacManus-Kelly Advertising Agency, entering the selling field as assistant sales manager of Earl Motors, Inc.

Hooper Returns to Old Company

J. Charles Hooper, former sales representative of the Oakes Co. of Indianapolis, has returned to the Cincinnati Ball Crank Co., with which he was identified prior to 1909, and will take charge of Balcrank bumper sales in the Eastern territory. As district manager he will not locate definitely in any one city but will divide his time among the principal cities between Baltimore and Boston.

Johnson Visiting Detroit

Caldwell S. Johnson of the General Motors Export Co. is visiting in Detroit after a long trip through the Far East. Mr. Johnson tells of the establishing of a route across the Syrian Desert from Haifa and Beirut to Bagdad for mail and transportation purposes over which Cadillac cars are used. The running time for a distance of 500 miles has been re-

TEWKSBURY APPOINTED TO DETROIT DISTRICT

WASHINGTON, May 21—H. H. Tewksbury, chief of the research section of the Automotive Division of the Department of Commerce, has been named to be the general manager of the new district office of the department, opening a branch office in Detroit.

The new office will be the tenth general branch of the department and will deal primarily with problems relating to exports of automotive products. Because of Mr. Tewksbury's knowledge of the automobile exporters' problems he was appointed by Secretary Hoover to the position.

For several years he has been in the foreign service branch of the Government, stationed in Cuba, and prior to that was connected with the General Motors Co. He has been connected with the automotive division since August, 1923.

L. M. Brin, research assistant in the department, will succeed Mr. Tewksbury as chief. For four years Mr. Brin was connected with the Mexico Automobile Supply Co., Mexico City, in a selling capacity, in both Mexico and Panama. He has been with the bureau since June 22, 1923.

duced from seven or eight weeks by camel travel to two days. The motor route brings within quick and easy access to tourists the ancient ruins of Ballbek, Palmyra, Babylon and other ancient cities. Plans are being made to extend the route eastward from Bagdad to Teheran, Persia, giving it a total extent practically equal to the distance from Detroit to New York.

Wood Williams Elected a Director

Wood Williams of Merrill, Lynch & Co. has been elected a director of the Edmunds & Jones Corp.

Albin Handles European Sales

L. D. Albin, formerly general sales manager of the Ingersoll-Rand Co., New York City, has been elected vice-president in charge of European sales of that company. D. C. Keefe, formerly assistant general sales manager, succeeds Mr. Albin as general sales manager.

Haswell in Own Business

H. C. Haswell has resigned as research engineer of the Locomobile Co. of America, to engage in business for himself as consulting engineer, with headquarters at Scarsdale, N. Y.

Dealer Sales Effort Needs Makers' Help

Association Managers Believe Energetic Work Necessary to Move Stocks

DETROIT, May 21—Evidence of the organized work being done by dealer associations to better conditions in the automotive trade was seen in a convention of association managers from all parts of the country held here this week under the auspices of the National Automobile Dealers Association.

Delegates were present from city associations from coast to coast and from several State associations. The exchange of ideas emphasized the quality of the work that is being done in the interest of the entire industry and the motor vehicle owning public by the associations and their executives.

The principal exchange of information was on the subject of developing automobile salesmen. The managers took home with them reports of three successful association plans, one of which educated outside men for automobile salesmanship while the other two aided men already in the business in improving the quality of their salesmanship.

Claude Holgate, manager of the Newark, N. J., Automobile Trade Association, started the discussion by describing an automobile salesmanship school conducted over a period of weeks for 60 men recruited from outside the industry. These men, who paid \$50 each for the course, which cost the association about two-thirds that sum in addition, attended night classes while they continued their regular work. All but a few of the 60 later qualified for sales positions with Newark dealers.

Herbert Buckman, manager of the Cleveland association and Charles A. Baird, of Youngstown, told of schools conducted to develop salesmen already in the business, both reporting that the work had been successful.

Another angle of sales management
(Continued on page 1150)

Fitzpatrick Joins Federal

Samuel Fitzpatrick, who has been export manager for the Columbia Motor Car Co. for number of years, has resigned to become assistant export manager of the Federal Motor Truck Co. In this capacity he will assist Ward W. Mohun in the development of world markets for Federal products. The position at Columbia has not been filled for the present. The promotion of F. L. Pierce, sales manager at Federal, to the position of vice-president in charge of sales, also is announced by the Federal company.

Small Profit Netted on Tires in 3 Years

**With \$750,000,000 Total Assets,
Ten Companies Made Less
Than \$35,000,000**

AKRON, May 21—With assets aggregating approximately \$750,000,000, ten of the most important rubber producing companies show total net profits for the last three years of less than \$35,000,000, or under 5 per cent, according to figures compiled here during the past week.

The list includes the Firestone Tire & Rubber Co., the Fisk Rubber Co., Goodyear Tire & Rubber Co., B. F. Goodrich Co., Hood Rubber Co., Kelly-Springfield Tire & Rubber Co. and the United States Rubber Co.

During the past year these companies showed a net profit of approximately \$28,000,000, which is practically the same as shown during the previous year. During 1921, however, the companies showed a net loss of approximately \$20,000,000.

In 1921 just one-half of these companies showed deficits, while in 1923 only two reported deficits. Only four went through the three-year period without showing losses.

The following table, with the last 000 dropped, shows the profits of the ten companies over the three-year period:

	1923	1922	1921
Firestone	\$6,105	\$7,348	*\$17,176
Fisk	2,084	1,655	*6,398
Goodyear	6,507	4,388	3,620
General	1,037	1,061	173
Goodrich	3,025	3,048	*8,983
Hood	1,924	....	....
Kelly-Springfield	*1,166	3,144	*665
Keystone .....	....	*899	*678
Lee	*72	370	9
United States	7,393	7,692	10,192
* Deficit			

Firestone Tire & Rubber Co. in making official denial of a price cut on Ford size fabric tires states that at the beginning of the month the company placed on the market, through its dealers, low priced unguaranteed fabric tires with which to meet cut rate and mail order competition.

"In justice to the tire manufacturers and to the dealers I want to state that no cut has been made and that none is contemplated at this time," the Firestone statement reads. "On May 1 our company advised dealers that we were preparing to supply them with unguaranteed, 30 x 3 and 30 x 3½ fabric tires to meet cut rate and mail order house competition."

It has been known for some time that some of the larger producers of tires were making lines of tires which did not bear the company names to meet this type of competition.

Lambert Tire & Rubber Co., exclusive producer of cushion tires for passenger and commercial motor vehicles, announces that plans have been completed

for an increase of one-third in production capacity of the plant at Barberton.

This will be about 800 cushion tires a day, according to Guy M. Collette, general manager, which is equal to approximately 2500 pneumatic tires a day.

The increase will be made possible through the addition of mill lines rather than through new building and will be financed from earnings of the company. This is the fourth increase in production capacity provided for by the company in slightly over three years when production of cushion tires was slightly in excess of 100 a day.

The company does a large export business, principally in England and Mexico.

B. F. Goodrich Co. has issued a statement giving the opinion that within the next four or five years the balloon tire will be almost universally adopted to the exclusion of high pressure tires.

"Should automobile designs change radically enough in the future to permit of a super cushion tire," the statement further says, "tire engineers will follow no doubt with a development of a practical one or two ply tire. This, however, in our opinion is a remote possibility."

Several companies in Akron are experimenting with a two ply tire at the present time.

Value of Tire Shipments Declined First Quarter

NEW YORK, May 21—Value of shipments of tires and tire sundries in the first quarter of 1924 showed a perceptible decline from the figures of the corresponding period in 1923, according to the results of the questionnaire sent out by the Rubber Association of America.

The total valuation was \$133,652,000, as compared with \$156,908,000 in the first three months of last year. In this compilation pneumatic tires accounted for \$104,781,000, against \$126,330,000. The business in inner tubes showed improvement, however, the valuation of this product in the quarter being \$18,026,000, in comparison with \$17,308,000.

In the manufacture of tires and tire sundries, the industry consumed 60,920 long tons of crude rubber in comparison with 72,303. An inventory of the crude rubber in the United States and afloat as of March 31, showed 68,947 long tons in the country and 40,903 afloat.

Fifth Avenue, New York, Closed to Empty Taxicabs

NEW YORK, May 19—Police executives in charge of traffic are trying a bold experiment in their effort to reduce congestion on the main thoroughfares, an order being put into effect today barring more than 1000 taxicabs from "cruising" on Fifth Avenue, looking for passengers. As a result of the first day's experiment, the cops declare it far easier to handle traffic on Fifth Avenue, although the new order affected Broadway, because the chauffeurs, barred from the avenue, sought business on the Great White Way.

Ford Averages 8385 Sales First 10 Days

May Is Exceeding Any Previous Month This Year—Dealers Drawing on Stocks

DETROIT, May 20—Ford retail sales in the first ten days of May in the United States have averaged 8385, a larger average than for the first ten day period of any month this year. This average is considerably in excess of the same period in April and is looked upon by the company as an indication of a continuing upward trend in the retail sales market.

Figures compiled by the company show a total of 757,021 units retailed to customers from the first of the year to May 10. This includes all products, Ford cars and trucks, Lincoln cars and Fordson tractors. Ford car and trucks deliveries alone show a gain of 102,158 over the same period a year ago. With the increases already registered this month and with the present outlook for business, the company anticipates a new high sales figure in May.

An analysis of sales in the many territories of the country shows a gradual expansion, the company reports, though all districts are not sharing alike in the increases. The districts, however, which are not expanding business or show reductions are more than counterbalanced by the large number of territories which show increases.

Production schedules at the factory are considerably lower than the rate of sales at retail, this being intended to permit dealers to draw on stocks to meet the full extent of their business. It is the first time that the Ford dealer organization has ever had any stock of cars at this season of the year, and the company is firm in the conviction that these would have been cleared away had weather conditions been better in the early year. As it is these stocks are not expected to withstand many more weeks of continued heavy sales.

Prices of Rubber Down and May Drop Further

NEW YORK, May 20—Crude rubber prices continue to drop, and yesterday's quotation of 17½ cents for spot ribbed smoked sheet crude represents the lowest levels in nearly two years, with indications pointing to lower prices.

Importers and dealers feel that this decline is likely to result in the further cutting of rubber exports, and it is believed that the exportable maximum under the Stevenson plan will be reduced to 55 per cent of the 1920 total for the quarter beginning Aug. 1, the present rate being 60 per cent. This is possible because the exportable rate is determined by the average price at which crude rubber sells in the three months prior to the date at which the rate is fixed.

Body Builders Plan Comprehensive Show

Many Companies Have Taken Space at Annual Event to Be Held in Detroit

DETROIT, May 19—Plans are rapidly maturing for the fourth annual convention of the Automobile Body Builders Association and the third annual body builders' show, which will be held at Hotel Statler, June 3 and 4. In arranging the program the association has had as its main aim the promotion of acquaintance and business among the makers of body materials and parts, passenger car and commercial body builders and the car manufacturers.

The show will include displays of almost all materials and parts used in connection with body builders as well as displays of a number of mechanical helps in the making of bodies and parts. Already most of the space available has been awarded, among the exhibitors to date being:

Allied Metal Products Corp., metal specialties; American Forging & Stamping Co., bow sockets and drop forgings; Atwood Vacuum Machine Co., door bumpers and hinges; Black & Decker Manufacturing Co., portable electric drills, screw drivers and grinders; Boyriven, Inc., upholstery fabrics; A. S. Campbell Co., dome lights and curtain windows; Chicago Curled Hair Co., curled hair pads; Continental File Corp., special cut files for body works; Detroit Rubber Products, Inc., felt-covered window channels; Duratex Corp., coated fabrics; Eagle-Ottawa Leather Co., leather.

Eberhard Manufacturing Co., body iron, iron seats, hinges; English & Mersick Co., body hardware; Ferro Stamping & Manufacturing Co., door locks, hinges, bumpers and handles; General Aluminum & Brass Manufacturing Co., cast aluminum door and window frames; Haskelite Manufacturing Co., ply metal and ply wood; Houze Convex Glass Co., glare-proof glass; Laidlaw Co., Inc., upholstery fabrics; Murphy Varnish Co., varnishes; National Seal Co., door locks; Parsons Manufacturing Co., hinges, locks and window lifts; J. D. Randall Co., clinch core; Textileleather Co., coated fabrics; Valentine & Co., paints and varnishes; William Wiese & Co., upholstery fabrics.

The two major topics of the convention will be "Body Builders' Overhead Cost" and "Body Finishes," but the program is well made up and contains many other addresses of interest to this branch of the industry.

April Output Estimated at 373,139 by Government

WASHINGTON, May 21—Figures compiled by the Department of Commerce place April production of automobiles and motor trucks at 373,139 as against 382,456 in March and compared with 382,746 in April of last year. This is a decline of less than 3 per cent from March output. Previous estimates had put the total for last month at 358,600.

Detailed figures, segregating cars and trucks, follow:

PASSENGER CARS

	1922	1923	1924
January	81,696	*223,822	287,302
February	109,171	*254,782	336,373
March	152,962	*319,789	*348,350
April	197,224	*344,661	337,037
May	232,462	*350,450	.....
June	263,053	*337,402	.....
July	*225,103	*297,371	.....
August	*249,498	*314,399	.....
September	*187,711	*298,928	.....
October	*217,582	335,023	.....
November	*215,362	284,923	.....
December	*208,016	275,439	.....

TRUCKS

	1922	1923	1924
January	*9,596	*19,732	*28,922
February	*13,360	*22,173	*31,151
March	*20,036	*35,284	*34,106
April	*22,665	*38,085	36,102
May	*24,120	*43,730	.....
June	*26,354	*41,173	.....
July	*22,083	*30,692	.....
August	*24,711	*30,872	.....
September	*19,495	*28,578	.....
October	*21,824	*30,139	.....
November	*21,967	*28,073	.....
December	*20,394	*27,762	.....

* Revised.

Parsons Will Produce New Radiator Shield

DETROIT, May 19—The Parsons Manufacturing Co., in addition to its regular line of equipment which it sells direct to car and body manufacturers, is soon to bring out a radiator shield, which it will sell as equipment and also to the car owner. In selling to the replacement field the company is planning to sell direct through jobbers, and to supplement the merchandising effort by the jobber with direct factory representatives in the retail field.

In taking this course it will confine its actual sales relations to a selected group of large jobbing organizations, thus getting the benefit of disposing of its output through a minimum number of outlets. It will, however, through its own factory representatives, augment the sales efforts of the jobber sales forces by going direct to the retailer and assist the jobber in developing the market.

Only Half Gasoline Tax Paid to State When Due

LOS ANGELES, May 21—Only about one-half of the gasoline tax said to be due the State for the past quarter had been paid into the hands of the Board of Equalization May 10, and, according to reports from the office of the State comptroller, the tax is now delinquent. No explanation is offered for the failure of the gasoline companies to conform to the law.

The gasoline tax due to the State for the quarter amounts to approximately \$3,047,000, but only about \$1,800,000 was paid. The tax is paid by refiners and producers, upon whom devolves the necessity of making the collections from consumers.

Says Rail Cars Turn Deficits to Profits

Secretary of Transportation Institute Tells Value to Branch Railway Lines

SOUTH HAVEN, MICH., May 19—Addressing the Chamber of Commerce, Carleton B. Hutchings, secretary of the National Transportation Institute, spoke enthusiastically on the development of the motor driven rail cars, which, he says, permit of fast and adequate service on branch lines, which in turn enable smaller cities to hold their manufacturing and shipping business and also to build them up.

Speaking of the difficulty of maintaining good rail service on short line railroads and branch lines, Mr. Hutchings pointed out that "light weight motor-driven railway cars are coming rapidly into use to turn branch line deficits into profits."

On this subject he said:

Since the war sixty railroads or more have installed gasoline driven railway cars in local service on branches or sections of their lines. Revolutionary changes in transportation practices already are taking place. Besides the steady development of highway transportation there has recently been a revival of activity in the field of the short-line railway.

The automotive industry is scarcely 30 years old. The experiments with combustion engines on railway cars were undertaken only after the motor vehicle had established itself as a permanent commercial utility. More progress has been made in the past five years toward the solution of the problem of the short-line railroad than in the previous 25 years.

Transition Now Taking Place

It will be many years before the transition from present methods of branch line operation to the new basis is generally accomplished. There can no longer be any doubt that such transition is taking place. Early experiments resulted in some costly failures and delays but have resulted in the development of efficient and durable types of cars which are now coming into regular use on many railroads.

One of the great Northwestern railway systems on one of its branch lines operates one of these cars, making 188 miles a day. During the first nine months of operation it netted \$18,000 from this service, after deducting all operating expense, a high rate of depreciation and interest. The railroad lost through its operation of a steam train for the same number of trips on this branch line, \$25,000 a year.

The solution of one important phase of America's transportation problem seems to be within reach and business prospects of a small community are greatly enhanced.

WEIGHTS-MEASURES MEETING

WASHINGTON, May 21—The seventeenth annual conference on weights and measures will be held at the Bureau of Standards from May 26 to 29. The program includes many important subjects, such as specifications and tolerances for vehicle tanks and taximeters.

Good Business Done at Equipment Show

Is Pronounced Success—Exhibit and Convention Open Busy Week in Detroit

DETROIT, May 21—Men representing every branch of the automotive business and every part of the civilized world are crowding Detroit this week, attending one or another of the various automotive meetings which are being held here.

The National Automotive Service convention and the Automotive Maintenance Equipment show began on Monday with a thoroughly representative attendance of dealers and repairmen. The International Motor Transport Congress, held under the auspices of the National Automobile Chamber of Commerce, started this morning and will continue until the end of the week.

Other Meetings During Week

Other organizations holding meetings during the week include the National Automobile Dealers Association, the Automotive Equipment Association and the Automotive Electric Service Association.

The N. A. C. C. balloon tire committee with H. H. Rice as its chairman meets with representatives of the Society of Automotive Engineers and the Rubber Association of America on Friday. At this meeting a definite attempt will be made to thrash out differences and to arrive at a constructive plan for cooperative action.

The maintenance equipment show, the first of its kind ever held, went over the top as a pronounced success shortly after it opened. It contains exhibits of the latest garage tools and maintenance equipment of various sorts, laid out in attractive fashion for inspection. Both the pleasing appearance of the exhibition and its practicability created a highly favorable impression with the repairmen who viewed it.

The show has been well attended every day up to the present time, and many exhibitors report considerable business being done on the floor.

Convention Well Attended

Nearly 300 people went to the opening session of the service convention on Monday afternoon and listened to talks dealing with service relations with the public, selection and training of mechanics and repair shop layout.

The utility of the motor vehicle and its function as an integral part of economic and social life is being recognized more fully each year in every country of the world, according to ideas expressed by delegates attending the opening session of the transport congress. Various difficulties are hindering automotive development in foreign lands, however, which are not present in the United States.

High prices for gasoline and for vehi-

cles are the chief obstacles to more rapid growth in Australia and South Africa, representatives from these countries told the delegates at the opening session of the Congress. Greater mileage of improved roads is one of the chief needs in the Argentine, while high taxes and financial arrangements are the items which most concern the German trade.

More than 300 people attended the opening session this morning. There were in excess of 150 delegates from foreign countries, representing 56 different nations.

In addition to the discussion of automotive conditions in specific countries, there was presented on the first day a general picture of automotive development, designed to visualize for the foreign visitors what the motor vehicle has accomplished in the United States and what it can accomplish abroad.

John N. Willys, chairman of the N. A. C. C. Foreign Trade Committee, opened the congress with a few brief words of welcome to the delegates, in which he stressed the significance to social progress of this first world gathering in the interest of motor transport.

Other speakers on the first day were: Dr. H. H. Hills, vice-president of the Packard Motor Car Co.; T. R. Dahl, vice-president of the White Motor Co., and Sir Henry Worth, president of the Canadian National Railways.

Bus Use Helps Stations Doing Electric Service

DETROIT, May 21—That the increased use of buses has and will continue to have its effect upon the authorized electrical service station of the equipment manufacturer was brought out at the spring meeting of the service managers of the electric unit makers in an all day session yesterday in the General Motors Building.

It developed that at least a $1\frac{1}{2}$ hp. motor will be necessary to drive the equipment for testing bus generators, etc., and it was determined that the makers of test equipment should be advised, also such service stations as were contemplating buying or installing equipment. A motor speed of from 300 to 3000 r.p.m. was recommended. The use of a tachometer of from 300 to 330 r.p.m. was approved.

The discussion of the relation of service to parts resulted in the managers declaring that service to the owner should be first, the trade next and that parts and accessories should be a secondary consideration with the service station. That there is need for more intensive selling of service was the unanimous opinion of the meeting.

The committee will meet in September at Eaglesmere Park, Pa.

ARMY TRUCKS FOR HIGHWAYS

WASHINGTON, D. C., May 22—A bill authorizing the transfer of \$12,000,000 worth of Army trucks and tractors to the Department of Agriculture for work on public highways was passed Wednesday by the House and sent to the Senate.

Dealer Sales Effort Needs Makers' Help

Association Managers Believe Energetic Work Necessary to Move Stocks

(Continued from page 1147)

was presented by Carlton Proctor of the Buffalo association, whose organization makes up monthly charts of sales in the territory as a whole and for each car. The charts show comparative figures for the months of this year and last and are used by the association management in individual conferences with dealers to help them understand better their position in the business of the territory.

From Cincinnati came a story of an association news letter, edited by Manager Harry T. Gardner, which provides dealers and their sales managers with material for sales meetings.

In informal discussions the association managers generally were agreed that the current sales situation emphasizes the need of the most energetic work by manufacturers to help dealers in working out the prevailing overstocks in dealers' hands of a good many makes of cars.

The managers believed also that current events have demonstrated that the industry generally has gone too far in creating retail outlets for cars and that persistent efforts should be made to work back to territories that will provide all dealers with reasonable profit opportunities.

It was noticeable, however, that none of the managers were looking for a cure of the situation by the manufacturers but realized that this would have to be worked out by the dealers, assisted by their associations and to a greater extent than has prevailed by the manufacturers.

About 40 managers attended the conference which was presided over by Lynn M. Shaw, assistant general manager of the N. A. D. A. in the absence of General Manager C. A. Vane, on account of illness in his family.

New York Taking Steps to End Traffic Problem

(Continued from page 1142)

The investigators believe that the automobile saturation point in this region will not be reached until 1950, when it is expected there will be 16,800,000 persons and a motor vehicle for every $3\frac{1}{2}$ persons.

They stated:

Assuming a ratio of $3\frac{1}{2}$ persons per vehicle in 1960, this would mean that in that year, with the estimated population of 19,000,000, there would be 5,430,000 motor vehicles registered within the entire area, or 35 per cent of the total United States registration for the year 1923. These figures are given as an indication of what this district is heading toward at the present time and to point out the need for such constructive planning as will avoid any such future congestion.

Electric Equipment Makers Adopt Code

Action Taken by Governors of Association—Covers Their Business Dealings

NEW YORK, May 19—A code of ethics that has been under discussion for more than a year was adopted by the board of governors of the Automotive Electric Association at a two-day session at Briarcliff Lodge. The general tenor of the code relates to sound business methods to be followed by makers of starting, lighting and ignition apparatus and batteries not only among themselves but in all their business affairs. Emphasis is given to following good business methods, avoiding the circulation of misleading reports and doing such things as injure rather than build up.

New Code of Ethics

In part, the code reads as follows:

As members of this association we do not make false or misleading statements either written or oral, or circulate harmful rumors respecting a competitor's

- (a) Organization or personnel
- (b) Product
- (c) Selling price
- (d) Business
- (e) Plant capacity
- (f) Ability to deliver
- (g) Financial or personal standing
- (h) Infringement of patents.

In sales negotiations the efforts of salesmen should be confined to the merits of their own products except truthful comparison.

All equipment supplied should be equivalent in quality and performance to the samples furnished for test purposes.

We favor fair competition.

We make no misrepresentation in any advertisement, whether by direct statement, omission of facts, inference or subterfuge.

Last, but not least, every member should test his every transaction by the standard of truth and justice.

Standardization Being Pushed

The report of the standards committee of the association showed that standardization efforts are being pushed vigorously. The work now in hand supplements the standards on generators and starting motors that have been set up, and relates to general wiring of the chassis, switches, grounded circuits, battery location, protection of wiring against water, sizes of cables to be used, distributor mounting on the engine, fuse clips and many other details. This general standardization work is in the formative stages and will be considered at the annual meeting of the organization to be held at Eaglesmere Park, Eaglesmere, Pa., Sept. 8-11.

A business manual for the use of electric service stations has been drafted by the service committee under the direction of Earl Turner, general manager of the association. Although only in its early stages, it is already a booklet of nearly

12,000 words and deals with the operation of an electric service station, taking up such questions as shop layout, equipment, stock of parts, methods of calculating overhead and everything, in short, that concerns the technical and business aspect of such a business.

After revision, the book will be passed on at the Eaglesmere meeting. Under the present plan it will be distributed to all electric service stations and perhaps to battery stations, the association and manufacturers cooperating.

The question of free electric service for the 90-day guarantee period came up for much discussion, manufacturers of starting, lighting and ignition apparatus being about equally divided for and against such service. All agreed that the volume of this service is not large but nevertheless it presents a troublesome question. While the majority felt that an ironclad rule may be necessary, yet it was believed there would be difficulty in enforcing it for the reason that when the apparatus proves defective after short use it should be made good under the guarantee and the owner should not be required to pay the labor charges connected with the repairs.

Few of S. A. E. Section Favor Increasing Dues

NEW YORK, May 16—A proposal to increase dues of members of the Society of Automotive Engineers as a means of augmenting the funds available for activities of the various sections of the society was discussed at a meeting of the Metropolitan Section held here last evening.

Most of the discussion of the proposal, favored by some members of the section's governing committee, but not indorsed by the sections committee of the society, was unfavorable to an increase.

A motion intended to put the section on record as favoring the increase finally was amended in such a way as to embody simply a request addressed to the council of the society to the effect that steps be taken whereby section officers will be relieved of the routine of collecting section dues, this work to be handled largely through the New York office of the parent society.

Announcement was made to the effect that a canvass of the mail vote for officers of the section showed that the following had been elected by a practically unanimous vote: for chairman, A. F. Masury; vice-chairman, C. T. Myers; treasurer, C. B. Veal; secretary, F. H. Dutcher; members of governing committee, E. E. LaSchum, J. W. Lord and R. E. Plimpton.

Milwaukee Section Meeting

MILWAUKEE, May 21—Thomas Midgley, Jr., of the General Motors Chemical Co., will address the Milwaukee section of the Society of Automotive Engineers in joint session with the Engineering Society of Milwaukee on Wednesday, May 28, at the City Club in Milwaukee. This meeting was to have been held May 20.

Japanese Appreciate Motor Vehicle Value

As Result Importations Probably Will Be on Larger Scale Than Heretofore

TOKIO, May 6 (*by mail*)—Because of the preparedness of the American sales organization in Japan, American motor vehicles have obtained not only the greatest credit for services rendered during the recent earthquake, but have practically monopolized the post-earthquake sales.

The city of Tokio alone has given an order for 1000 twelve-seater Ford buses, while Stars, Buicks, Cadillacs, Chevrolets, G.M.C.'s, Macks, Federals, Maxwell, Chalmers and Grays have been sold in considerable numbers to municipalities, railroad lines and industrial and building concerns.

Thanks to a number of trucks and automobiles having escaped destruction in the earthquake, it was possible at that time to establish rapid road supply and ambulance services in Japan. In Tokio particularly was it possible to resort to these methods.

There is no doubt that the Japanese nation has come to appreciate, therefore, the great value of the motor vehicle for furthering national transportation, and future imports of these vehicles will probably be on a larger scale than they have ever been hitherto. It is estimated that the number of motor vehicles in Japan doubled during the last four months of 1923.

Empire Has 19,000

WASHINGTON, May 23—Figures obtained by the Department of Commerce place the number of motor vehicles registered in Tokio on April 1, 1924, at 9835.

Tokio's registration is equivalent to 65 per cent of the entire country, which would make the total for Japan proper approximately 15,127. In addition, it is estimated that there are in Tokio about 1400 motor vehicles used on bus lines as official and diplomatic service cars and trucks, this making a total for Tokio of 11,235.

The number of buses in other parts of the country is estimated at 1500, to which may be added approximately 1000 belonging to the War and Navy Departments, making the grand total about 19,000 for the entire country.

SALES IN FRANCE KEEP UP

WASHINGTON, May 22—A cable from Commercial Attaché Chester Lloyd Jones advises the Department of Commerce that in France automobile tire sales, both domestic and export, are active, with prices unchanged. Domestic sales in automobiles are brisk, and factories are working to capacity; export orders, however, have decreased, the cable adds.

May Will Be Normal in Plant Operation

Cannot Be Expected to Reach High Record That Was Established a Year Ago

NEW YORK, May 19—Half way through May, it is clearly apparent that the automobile industry will not produce as many cars and trucks this month as it did in the same period last year. Not even the greatest of optimists could expect this, in view of the fact that May, 1923, established a record of 394,088, the best of the 12 that constituted the record year of the industry, with a total production of more than four million.

Yet this May is going to be a normal one at that, one that ordinarily would arouse the country to the great activity of the automobile manufacturers, but it suffers in comparison with the record month, that's all. Another point having a bearing on the present situation is that heavy sales this February which, in the past, has been a dull month, has to a certain extent taken the edge off May demand.

Caution Still Shown

Reports that come from the factories now show that the manufacturers are proceeding cautiously, knowing as they do that whereas production for the first four months was 23 per cent in excess of the same stretch in 1923, sales are from 15 to 20 per cent below last year's retail demand at this time. Consequently, they are not crowding their dealers to take more cars than they can readily handle. In this they are backed by local bankers, who are telling their dealer clients to keep stocks down and buy for needs of the immediate future only.

As the months slip by it is becoming more and more apparent that weather has been an important factor in slowing sales, this being shown in the first week of May, when fair and warmer conditions produced retail business that was reminiscent of a year ago. Given the brand of weather that belongs to this period of the year, the industry will feel the effects at once in the way of increased sales and consequently increased production.

The weather is not altogether to blame either, for undoubtedly the political uneasiness of the country as a whole and the business hesitation occasioned by the failure of Congress to settle the bonus and tax questions

have had a major effect on automobile sales, for capital's timidity brings with it business depression, unemployment, and consequently lack of money with which to buy automobiles.

Conservatism in production also is reflected in other branches of the industry, notably among the tire makers who, as usual at this time of the year, have slowed down until production in the Akron district is below 100,000 a day. This is not causing any alarm, for dealers' shelves are well stocked, through slow retail movements caused by the inclement weather of this so-called spring. Parts manufacturers also are keeping step with their customers, the car builders, so, taken as a whole, the industry is on a sound footing.

Lewis G. Vogel, Agency Vice-President, Dies

DETROIT, May 19—Lewis G. Vogel, vice-president of the Robert Frothingham outdoor advertising agency of this city and New York and a prominent figure in the automotive industry, died at Warsaw, N. Y., last Thursday.

Mr. Vogel was for years on the advertising staff of the Class Journal Company publications, was publisher of the Light Car, following which he represented several of the leading automobile papers in Detroit, where he had a large circle of friends and acquaintances among the prominent executives in the industry. Taking over the contract for the outdoor advertising of the Ford Motor Co., he founded the Frothingham agency last fall, in which he was an active worker at the time of his death.

Six years ago Mr. Vogel suffered a paralytic stroke and for two years he was unable to move, except in a wheel chair. He showed gradual improvement, however, and, despite his crippled condition, was remarkably active in the business world up to the time of his death.

Farman Goliath Plane Makes Height Records

Paris, May 12, (by mail)—Two altitude records were broken this week by the Farman Goliath passenger carrying plane. With a useful load of 2200 pounds, exclusive of pilot, mechanician, gas and oil, Coupet attained an altitude of about 19,690 feet, the flight lasting one hour 49 minutes. The previous record, with this load, was made by Casale on a four-engine Bleriot, with an altitude of 16,076 feet.

With a useful load of 4400 pounds Bossoutrot took the same machine to a height of 15,420 feet in one hour 47 minutes 8 2/5 seconds, also establishing a world's record. The sealed barometers have been submitted to the Arts & Metiers Institute for verification.

Indiana Sales High Due to Ford Demand

April Gain Is 20 Per Cent Over March—Out-in-State Business Reported Good

INDIANAPOLIS, May 20—Retail sales of passenger cars in Indiana during April gained 20 per cent over March, with 14,533 new cars sold in April as against 11,621 in March.

The new record stands as the highest month's sales ever recorded in this territory, exceeding April of 1923 by 1615 cars and trucks, with an average gain of 12 per cent over last year's highest monthly mark of 13,810. During 1923 the records of new car and new truck sales were not segregated, so that exact comparison with the passenger car business of last year cannot be made.

The gain in April was represented entirely in Ford sales out-in-the-State, 8126 Ford cars being sold, against 6445 cars and trucks of that make during April, 1923. Indianapolis business ran about even with last year in this line but the State shows an increase of 1681 for Ford.

As a whole, Indianapolis and Marion County show an improvement over March and April of a year ago, but the increase is slight compared with the big jump in light car sales, particularly Fords, out-in-the-State. Truck sales for April fell off 8 per cent as against March—from 986 to 902.

For the first four months of this year, 45,002 new cars and trucks have been sold in the State.

Sales in New York Area Reached 12,133 in April

NEW YORK, May 21—A marked improvement in new car registrations in the metropolitan district during April is shown in the monthly sales analysis of Sherlock & Arnold. In the low and medium price field the total for the month was 12,133, compared with 8179 in March and contrasted to 11,050 in April last year. In the higher price class registrations totaled 972, compared with 674 in March and against 1180 in April of 1923. Total registration for April aggregated 13,105, as against 12,230 in April of last year and 8853 in March of this year.

Three cars lead the low and medium price field with sales in excess of 3000, while two others passed the 2000 mark. Two makes of cars showed to be leading the higher price field with sales greater than 600. Three others were above 100.

Recapitulation for the year follows

	Medium and Low Price	Higher Price
January	3,548	292
February	3,814	357
March	8,179	674
April	12,133	972
Total	27,674	2,295

Pick-up in Fall Seen in General Business

National Association of Manufacturers Hears Spring Trade Is Below 1923

NEW YORK, May 22—From the viewpoint of the automotive industry, the most interesting feature of the twenty-ninth annual meeting of the National Association of Manufacturers, which wound up its three-day session last night at the Waldorf-Astoria, was the annual survey of business conditions. This survey included up-to-the-minute reports, compiled within the last fortnight and based on information conveyed in 30,000 answers to the association's questionnaire.

While this composite report was not any too optimistic as to the present, it held out strong hopes for the fall, 84 per cent reporting prospects as fair to good to excellent in the autumn, with only a slightly greater percentage of those in the "fair" column than in the "good" or "excellent." Comparison of this year's spring trade with that of last year placed it at a lower stage.

Stocks About Normal

Stocks of goods on hand were reported about normal. A majority of manufacturers reported a decrease in employment. The greater number of reporting concerns noted an increase in wages over last spring. Production has fallen off, while there was a decrease in sales quantities.

An even greater number reported a reduction in sales values, while industrial peace seems to be general. It was the consensus of opinion that the failure of Congress to bring about tax reduction in June would have an adverse effect on business.

This general survey was subdivided into groups, the report on automobiles and accessories stating:

Business in this industry is pronounced good by 50 per cent of those reporting, with fair the verdict of 40 per cent, and poor of 40 per cent. Fifty per cent believes the prospects for fall business are good, 10 per cent excellent and 40 per cent fair. Compared with last spring, 35 per cent views business as higher, 50 per cent lower, and unchanged by 15 per cent. Normal stocks are reported by 68 per cent; low by 24 per cent, and over by 8 per cent. A large increase in employment over this time a year ago is reported by 5 per cent, a small increase by 40 per cent, a large increase by 10 per cent, and a small decrease by 45 per cent.

Labor Conditions

A shortage of skilled labor is reported by 14 per cent, while 86 per cent report an ample supply, and 100 per cent report the same situation in the unskilled labor market. A slight increase in wages as compared with last spring is reported by 62 per cent, with 28 per cent reporting a small decrease. Forty-eight per cent reports an average increase of 7 per cent in production, the same number report an average decrease of 9 per cent, while 4 per cent notes no change.

Sales quantities are reported by 56 per cent as showing an average increase of 14 per cent, and 44 per cent reports an average decrease of 20 per cent. An average increase of 17 per cent in sales values is reported by 38 per cent, with 52 per cent reporting an average decrease of 21 per cent.

No strikes are reported in this industry and 2 per cent of those reporting declared they have eliminated them entirely.

The rubber section reported along the same line, the majority believing that present business is fair, with this year's business lower than last spring. There has been an average increase of 33 per cent in production over last spring, most of the answers declared, while there has been an increase averaging 20 per cent in sales values.

(Continued on page 1154)

Branch of Yellow Taxi Established in Paris

PARIS, May 12, (by mail)—With a capital of 1,500,000 francs, a branch of the Yellow Cab Manufacturing Co. has been formed in France, under the title of Société Française des Automobiles Yellow, to import, export, assemble and manufacture automobiles produced by the Chicago firm.

Several years ago a small French company got on the streets of Paris with a number of Renault taxicabs painted yellow and bearing the title "Yellow Taxi," and as a consequence the Paris branch of the Chicago firm has had to select a title which would not clash with this.

The directors of the French Yellow Cab Manufacturing Co. are Albert N. Connell, banker; Henry Ducasse, engineer; Paul Dutasta, ambassador; Marcel de Jarny, engineer; Marie Albert Guionin, Léon Hempsy, Salvador de Lopez and Fernand Raux. The registered offices of the company are at 126 rue de Provence, Paris.

Ford Buys 2 Steamers for Transporting Coal

BUFFALO, May 21—The Ford Motor Co. has taken over the two steel steamers "Onondaga" and "Cayuga" from the American Shipbuilding Co. and the two boats are now at the Buffalo drydock being overhauled prior to being turned over to the new owners. Capt. William Wilson, representing the Ford Motor Co., is here supervising the repairs to the ships and it is expected they will be ready to leave here within two weeks.

The company will use the vessels for coal carrying between the lower lakes and the Northern Michigan peninsula, where the company has planing mills. They will bring lumber down on the return trips. In the fall of the year the boats will be sent to the Atlantic coast, where they will carry coal to several Ford plants from Virginia ports, and when this trade lets up they will be sent to Ireland and Germany with parts for the Ford plants in those countries.

Both will be changed back to oil burners, which they were originally.

Murphy Will Drive in European Races

Named to Handle Count Zborowski's Miller at Lyons and Also on Monza Track

PARIS, May 12 (by mail)—Jimmy Murphy, the winner of the 1921 French Grand Prix, has been commissioned to drive Count Zborowski's eight-cylinder Miller in both the European Grand Prix at Lyons, on Aug. 3, and the Italian Grand Prix on Monza track, next September. This will be Murphy's third appearance in Europe, for he drove a Miller in the Monza track 500-mile race last year, finishing third.

There will be twenty-two starters in the French race, as follows:

1. Sunbeam, H. O. D. Segrave,
2. Delage, René Thomas,
3. Alfa-Roméo, Count Masetti,
4. Schmid, Jules Goux,
5. Fiat, Felice Nazzaro,
6. Miller, Jimmy Murphy,
7. Bugatti, Pierre de Vizcaya,
8. Sunbeam, K. Lee Guinness,
9. Delage, R. Benoist,
10. Alfa-Roméo, Ascarì,
11. Schmid, Foresti,
12. Fiat, Pietro Bordino,
13. Bugatti, Ernest Friedrich,
14. Sunbeam, Dario Resta,
15. Delage, Albert Divo,
16. Alfa-Roméo, Campari,
17. Fiat, Salamano,
18. Bugatti, Prince de Cystria,
19. Alfa-Roméo, Louis Wagner,
20. Fiat, Pastore,
21. Bugatti, Constantini,
22. Bugatti, Marco.

Supercharger engines are likely to dominate in the European Grand Prix. Fiat will make use of this device on the straight eights, which are last year's cars rebuilt, and will doubtless use it also on two special cars now under construction and regarding which no information has been given out. Delage has fitted a supercharger to the twelve-cylinder V-type engine which was used last year and has also in hand a straight eight two-stroke with a supercharger built to Zoller patents.

Sunbeam has built a supercharger into last year's six-cylinder racing engines and claims an increase of 33 per cent in the power output at all engine speeds above 2000 revolutions. Experiments with a supercharger are being made on the cuff-valve Schmids, the Miller and the Italian Alfa-Roméos. Ettore Bugatti announces that he will run his straight eights without a supercharger.

INDIANA GASOLINE REVENUE

INDIANAPOLIS, May 21—Reports from the auditor's office show that during the first ten months of the 2-cent gasoline tax the State of Indiana collected \$3,705,850 at the cost of a very few thousands. March figures show but \$297,737 resulting from the tax, very convincing proof of the extreme severity of the weather that month.

Franklin Inventory Will Be Taken Now

**Regular Time Was December of
Last Year—Plant to Be Shut
Down During Period**

SYRACUSE, N. Y., May 21—Official announcement is made by the H. M. Franklin Manufacturing Co. that the factory here will be closed, commencing Thursday, for the annual inventory period. The plant has been operating only three days a week and recently laid off a large number of employees.

The company's statement follows:

The Franklin company is embracing the opportunity afforded by the present lull in automobile manufacture to take the inventory which would ordinarily have been taken last December, but which was then passed up in order not to interfere with the heavy production to provide a large reserve for spring. Ordinarily with full force, this is a job covering a period of at least two weeks. Under present conditions it will take considerably longer.

Coincidentally, several departments of the Franklin plant will be closed down, beginning Thursday, the move affecting about 580 men. In the meanwhile inventory work, together with the continuation of shipping, inspection and parts manufacture, will require a force of approximately 1100 people.

800 Deliveries in April

Measured by the sales records of the Franklin company, the temporary curtailment of production of cars reflects a reduction in actual business volume about even with the present normal level of the industry as a whole. Retail deliveries by Franklin dealers during April totaled more than 800 cars.

Delivery reports received at the factory the first seventeen days of May show approximately a 35 per cent increase over a similar period in April, which would indicate for the month a total of well over 1000 cars. This business is reducing stocks of cars in dealers' hands and will mean ultimately a resumption of the manufacturing schedule.

The stock of cars available for shipment at the factory has been reduced 500 cars and will be drawn on further by dealers' requirements during the inventory period.

Sixty Traffic Managers Attend N. A. C. C. Meeting

DETROIT, May 19—Sixty traffic managers of automobile companies and railroad men of Detroit attended a dinner at the Oakland Hills Country Club, following the monthly meeting of member traffic managers of the National Automobile Chamber of Commerce at the General Motors Building last week.

At the N. A. C. C. business meeting, proposed railroad rules for the handling of automobile freight cars, standard design for same, Section 28 of the Shipping

Act, current legislation affecting the Railroad Labor Board and the Transportation Act, readjustment of rates in Eastern territory, which it is expected will soon have the attention of the Interstate Commerce Commission, and rates on a number of automobile parts, occupied the attention of the traffic men.

Addressing the gathering at the dinner, Walter P. Chrysler, president of the Maxwell Motor Corp., referred to his start in life as a railroad man and the sympathetic understanding of their problems and the importance of their work. He expressed the hope that the growing activities of his company would result in corresponding advantage to the railroads and prove profitable to them.

Represented at the meeting were:

Buick, Cadillac, Chevrolet, Dodge Brothers, Gray, Hupp, Lincoln, Maxwell, Oakland, Olds, Packard, Paige, Pierce-Arrow, Studebaker, Yellow Cab, General Motors Corp., General Motors Traffic Association; K. A. Moore and F. L. Starck of the N. A. C. C. and J. S. Marvin, chairman of the conference.

INDUSTRIAL NOTES

Hawkeye Dart Truck Co., Waterloo, Iowa, is installing equipment at the recently purchased truck factory for the manufacture of curb pumps for gasoline filling stations. Pumps will be offered to the trade as well as sold largely through the Hawkeye Oil company. A rotary type pump is used.

Eiseman Magneto Corp. of New York has removed its Detroit office from 429 Willis Avenue West to 4145 Cass Avenue.

Pick-Up in Fall Seen in General Business

(Continued from page 1153)

The report of the Committee on the Open Shop reiterated its sentiments of last year, when it declared:

The open shop question is much more than one of political scope and it cannot, in the final analysis, be settled in the political arena. It is, rather, an economic issue.

The open shop principle is clearly recognized and embodied in fundamental national law. The real question is one of full and impartial enforcement of existing law and maintenance of order. If this were accomplished there would be no need of considering the political expediency of the open shop principle.

CAMPBELL-EWALD BRANCHES

DETROIT, May 20—Campbell-Ewald Co. has opened branch offices in Los Angeles and San Francisco to give additional service to clients. Harry Elliott will be manager of both coast offices, with Willard S. Wood in active charge of the Los Angeles branch. The San Francisco office is in the Chronicle Building and the Los Angeles office in the Los Angeles Railway Building.

Other than the new branches, the company now has branches located in New York, Chicago, Dayton, Ohio, and Toronto, Ont.

Trade Association Test Cases Planned

Court Decisions Regarded as Means of Clearing Up Pres- ent Uncertainties

WASHINGTON, May 19—The uncertainty which has been caused to trade associations through their activities in supplying their membership with certain trade information is to be cleared up by the Department of Justice, which announces that it plans a series of test cases in an effort to obtain court decisions on a number of important points involved in the general question.

The appeal of the Maple Flooring Manufacturers Association from a restraining order by the Michigan courts against those engaged in statistical activities, which has been set down for hearing on Nov. 10 by the Supreme Court, is expected to furnish a test.

Attorney General Stone has announced that he will give his personal attention to clearing up the matter and removing the uncertainties now surrounding the extent to which trade associations may engage in the collection and dissemination of trade statistics. These uncertainties have arisen largely through a difference of opinion between Secretary Hoover and former Attorney General Daugherty, who have had a running fire of correspondence over how far associations may go in their efforts to operate in the pursuits of their business.

It is indicated at the department that Mr. Stone feels there is a distinct border line between what may be done and what may not be done by a trade organization in this field. To establish this boundary line clearly is understood to be the aim of the new Attorney General.

Mengel Purchases Site for Baton Rouge Plant

BATON ROUGE, LA., May 21—The Mengel Co. of Louisville, Ky., has acquired a 100-acre tract here on which it plans starting construction in the near future on a \$1,000,000 plant for the manufacture of automobile parts, wheels, etc.

All machinery for the plant has been ordered, and it has been stated by H. B. Holtvert, one of the officials, that the plant will probably be completed in time for starting operations within five months. When completed this will be one of the largest automotive parts plants in the South.

PARIS-CHINA FLIGHT FAILS

NEW YORK, May 20—Captain Pelletier d'Oisy did not quite finish his scheduled Paris-China flight, abandoning the effort at Shanghai, when his plane was completely wrecked in landing.

200 Latin Americans to Attend Congress

Highway Education Board Re- ceives Acceptance for Meet- ing Next Month

WASHINGTON, May 22—Between 200 and 250 acceptances from delegates to the Highways and Highway Transportation Congress, being held here on June 2, have been received by the Highway Education Board, under whose auspices the Congress is being held.

All plans for the entertainment of the delegates have been completed, and as a result of the congress it is expected that the delegates from Latin America will carry back with them one of the most complete stories ever visualized of what the automobile has done for America and its relation to highways in this country.

To date 19 countries have signified their intention of having representatives here. These are Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Salvador, Santo Domingo, Uruguay and Venezuela. Many of the delegates already have arrived and are being welcomed by officials of the Highway Education Board.

Altogether three weeks will be consumed in showing these representatives highway conditions in this country, through half a dozen or more States of the Union. The tour will begin officially on the morning of June 2, with an audience at the White House and conclude the latter part of June, after a close study of highway conditions that most closely approximate those to be found in Latin American nations.

The delegates, for the most part, are authorities on highway construction, highway finance and economics, and include the leaders in transportation thought and study.

Motor Truck Industries Selects More President

DETROIT, May 21—A. S. More was elected president of Motor Truck Industries, Inc., at a directors' meeting held this week. He succeeds M. L. Pulcher, president and general manager of the Federal Motor Truck Co., who has been president of the organization since its formation. Mr. Pulcher has resigned because of the pressure of other duties but remains a director of the organization.

Mr. More is now president of the Sellden Truck Corp. and previous to that was president and general manager of the Denby Motor Truck Co. He has been active in the truck organization since it was formed and succeeds to the presidency from the office of treasurer. Paul Moore of Service Motors, Inc., succeeds Mr. More as treasurer.

Extensive plans for the promotion of

the interests of specialized truck manufacturers were discussed and the association has settled upon some definite activities, one of the most important of which is a motor truck parade which will make an extensive trip through the country. Committees were appointed at the meeting to direct the activities of the association in legislative, survey, publicity and show plans.

FINANCIAL NOTES

Parish & Bingham Corp. stockholders have been notified that 30,000 shares of the preferred stock of the Midland Steel Products Co., which controls Parish & Bingham, will be exchanged on and after May 29 for the later stock outstanding on the basis of one share of Midland Steel preferred for five shares of Parish & Bingham.

McCord Radiator & Manufacturing Co. has declared the regular quarterly dividend of 75 cents a share on Class A stock, payable July 1 to stock of record June 20. The company announces net earnings for the first four months of the year of \$387,812, or \$8.61 a share on the 45,000 Class B shares outstanding.

Martin Parry Corp. reports for the first quarter net sales of \$1,132,092 and gross operating profits of \$178,829. After deductions the company reports net income of \$139,707, equal to \$1.39 a share earned on the 100,000 shares of no par value capital stock outstanding.

Yellow Cab Co. has declared three regular monthly dividends of 33½ cents and the Yellow Cab Manufacturing Co. three regular monthly dividends of 41½ cents, all dividends payable July 1, Aug. 1 and Sept. 1 to stock of record June 20, July 21 and Aug. 20.

Packard Motor Car Co. has declared its regular quarterly dividend of 1¼ per cent on preferred stock, payable June 15 to stock of record May 31.

Mengel Co. has declared a quarterly dividend of 1¾ per cent on the preferred, payable June 2 to stock of record May 31.

Hudson Motor Car Co. has declared the regular quarterly dividend of 75 cents, payable July 1 to stock of record June 20.

Morris Cars Used Most in England; Ford Next

LONDON, May 12 (by mail)—As a result of counts of passenger cars made at four widely separated points on main roads in England, it would appear that Fords no longer hold pride of place. The counts were made during periods of from two to three hours on a Saturday and Sunday, and showed that Morris cars constituted 12.7 per cent of the total.

Ford was represented by 7.4 per cent, while the next in order of number and percentage were Rovers (6.8 per cent), which included both 12 hp. and 8 hp. models, the latter being two-cylinder air-cooled runabouts.

One of the four points was on a main artery leading out of London, and at this count alone Fords were in greater numbers than Morris cars, the percentages there being respectively 12.4 and 10.2.

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co. second largest bank in America.

Although further curtailment of production and trade was in evidence last week, an improvement sentiment was noted in some markets, and commodity prices generally showed more firmness. Stock prices were irregular and trading was dull, while bonds strengthened with a further decline in interest rates.

Car loadings in the week ended May 3 numbered 914,040, compared with 878,892 in the preceding week and 961,617 in the corresponding period last year. The decline in total loadings from last year's figures is more than accounted for by the reduced traffic in coal.

Employment and wages declined in April, according to the Department of Labor. The number employed in 8422 establishments in fifty-two industries declined 2.1 per cent, while payroll totals decreased 2.5 per cent and per capita earnings 0.4 per cent. The reduced activity in the textile industry was a major factor in the aggregate decline, but was partially offset by gains in building and in building materials.

The consumption of cotton by domestic mills in April amounted to 480,010 bales, as against 483,928 in March and 577,396 in April of last year.

Production of crude petroleum in the week ended May 10 average 1,959,350 barrels a day, comparing with a daily average of 1,949,050 in the preceding week and 1,963,500 in the corresponding week last year. The only declines were in California and Texas.

Fisher's index of wholesale commodity prices stood at 145.2 last week, as against 145 in the preceding week and 145.2 two weeks before. The wholesale price index of the Bureau of Labor Statistics for the month ended April 15 is 148, which compares with 150 for March. The Bureau also reported an average decline for the month of 2 per cent in retail food prices.

Call loan rates were easier last week, declining to 3 per cent in the later sessions. Time loans continued at 3½ to 4 per cent, according to maturity.

Highway Commissioner Heads Safety Committee

WASHINGTON, May 21—Frank Page, Commissioner of Highways of North Carolina, has accepted the invitation of Secretary of Commerce Hoover to be chairman of a committee on highway construction and engineering in its relation to safety in traffic in the movement started by Mr. Hoover and a joint committee representing national organizations that are engaged in an effort to coordinate measures to improve safety in traffic.

There are seven committees in all which will engage in this work, one of which, the Committee on Motors, is headed by C. F. Kettering, president of the General Motors Research Corp.

Calendar

SHOWS

Jan. 3-10—New York, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Bronx Armory.
Jan. 24-31—Chicago, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Coliseum and First Regiment Armory.

FOREIGN SHOWS

May 23-June 1—Oporto, Portugal, Automobile and Aviation Exposition, Exposition Offices, 108 rua de Santa Catarina, Oporto.
May 31-June 15—Turin, Italy, Automobile Show.
Aug. 23-Sept. 6—Toronto, Ont., National Automobile Show in conjunction with the Canadian National Exhibition under the sanction of the Canadian Automotive Equipment Association and the Automotive Industries of Canada.
Oct. 2-12—Paris, passenger cars,

motor cycles, bicycles and accessories, Grand Palais.

Oct. 17-25—London, Annual Passenger Car Show, Olympia.
Oct. 22-31—Paris, motor trucks, stationary engines, garage tools and machine tools, Grand Palais.

RACES

May 30—Indianapolis.
June 14—Altoona.
July 4—Kansas City.
Aug. 3—Lyons, France, European Grand Prix.
Sept. 1—Altoona.
Sept. 1—Syracuse.
Oct. 4—Fresno.
Oct. 19—Kansas City.
Nov. 24—Los Angeles.

CONVENTIONS

May 26-29—Cleveland, American Society of Mechanical Engineers.
June 3-4—Detroit, Midsummer Meeting of the Automoto-

bile Body Builders Association, Hotel Statler.

June 4-6—Boston, National Foreign Trade Convention.
June 23-25—Atlantic City, American Society for Testing Materials.

June 23-25—National Team and Motor Truck Owners Association.

June —Washington, Pan American Highway Congress, under the auspices of the Pan American Highway Mission.

Sept. 7—Monza Track, near Milan, Italy, Italian Grand Prix.

Sept. 8-11—Eaglesmere, Pa. Annual Meeting of the Automotive Electric Association.

Sept. 22-26—Boston, Sixth Convention and International Steel Exposition of the American Society for Steel Treating.

Jan. 7—New York, Convention under the auspices of the

National Automobile Dealers Association, Hotel Commodore.

Jan. 26-29—Chicago, Eighth Annual Convention of the National Automobile Dealers Association, Hotel LaSalle.

S. A. E. MEETINGS

May 28—Milwaukee Section in joint session with the Engineering Society of Milwaukee, Fuels, Thomas Midgley, Jr., City Club, Milwaukee.
June 24-27—Summer Meeting of the S. A. E., Spring Lake, N. J.
Oct. 21-24—S. A. E. Production Meeting, Detroit.
Nov. 18-19—Joint Service Meeting of the S. A. E. with the N. A. C. C. Cleveland.—Aeronautical Meeting at Dayton at the time of the Pulitzer Races.
January—S. A. E. Annual Meeting, Detroit.

Lumber Mills Expect Better Body Demand

ATLANTA, GA., May 21—While the automobile and body trades of the North and East continue to buy ash, maple, elm and sap gum to some extent from the Southern mills, the markets at the principle Southern lumber centers still are in the throes of the marked depression which first was noted about four or five weeks ago, with the immediate future presenting itself as an uncertain quantity.

Larger mills of the district are cutting a fair amount of body lumber, but with orders less than they have been in many months much of the stock is being accumulated rapidly in the mill yards. Orders are 25 to 35 per cent less than two months ago, though prices remain generally unchanged.

Agents for the larger Southern mills calling on the Northern consumers state, however, that the situation is slowly improving, and that there are indications of a quickening of demand from the body trades within another two or three weeks.

Consequently, mills are not slowing up their production to any degree, and there will be ample stock on hand when the turning point is reached. Prices are not expected to experience any downward movement.

Los Angeles Voters Cut Weight Limit for Trucks

LOS ANGELES, May 20—A referendum against the ordinance recently passed by the Los Angeles City Council establishing the maximum gross weight of motor trucks at 26,000 pounds was indorsed by the voters at the recent election.

This means that the weight limit in Los Angeles will be 22,000 pounds, except for vehicles weighing in excess of

10,000 pounds net, registered prior to Sept. 1, 1923, which are permitted a gross weight of 24,000 pounds until Jan. 1, 1927.

The State law permits municipalities to increase the weight limits on vehicles to more than 22,000 pounds, which was the limit established for State and county highways. The Legislature recognized the greater tonnage necessary to move in municipalities, and the likelihood of increasing congestion through the use of a greater number of vehicles, if the lower weight limit were imposed.

The Los Angeles City Council passed an ordinance increasing the allowable weight, but its effect was nullified through an initiative petition circulated by agents of the Automobile Club of Southern California. The council refused to repeal the ordinance, and it went to a referendum vote. The automobile club carried on a very active campaign, which proved effective. The club has shown opposition to heavy vehicle transportation in every way possible.

Claim Advertising Bills Should Have Prior Right

CINCINNATI, May 17—Whether advertising sold and delivered by the Green, Fulton, Cunningham Co., Chicago, and the Power, Alexander & Jenkins Co., Detroit, advertising concerns, to C. H. Wills & Co., Marysville, is merchandise within the meaning of an agreement of loan creditors for subrogation of their indebtedness in a stipulated amount to merchandise creditors of the Wills company, is the question raised in an appeal filed in the United States Court of Appeals here.

Appellants are the two advertising concerns whose claims for \$21,163 and \$31,099 for advertising supplied to the Wills company were denied priority under this agreement on the ground that advertising is not merchandise within the meaning of the agreement.

Rubber Blocks Used on Boston Highway

RACINE, WIS., May 21—Clarence Wright, president of the Wright Rubber Products Co., has returned from Boston, where he personally supervised the laying of an experimental section of pavement with the rubber block developed by his company, at the approach of the Northern bridge to Cambridge. The city of Boston appropriated \$100,000 for test pavements, and experimental sections will be laid in other parts of the city. The result will govern the decision to pave the entire roadway and remaining approach to Northern bridge with Wright blocks.

The experiment by Boston follows the successful use of the rubber blocks in a crossing of the Chicago, Milwaukee & St. Paul Railway at Main Street in Racine about eighteen months ago. So well has the pavement withstood the heavy railroad and vehicle traffic that the Milwaukee road has contracted for paving two other crossings in Racine.

The Wright block is made from a composition with a base of rubber reclaimed from tires, tubes and other rubber waste. Originally the composition was designed for flooring, in which field it is widely used. The Wright company is now bidding on 100,000 sq. ft. of this material needed for the new Federal Reserve bank at St. Louis.

Akron Seeking to Solve Growing Traffic Problem

AKRON, May 21—Recommendations regarding the handling of vehicular traffic in Akron are expected in a report which will be submitted in the near future by a traffic commission appointed by Mayor D. C. Rybolt.

The body consists of six members representing the automobile group, rubber manufacturers, merchants and city government interests.